SAFETY ENGINEERING

A PUBLICATION OF ALFRED M. BEST COMPANY, INC.

1948
Best's 50th Anniversary Year

SEPTEMBER
Vol. 98 • No. 3

AMERICA'S PIONEER SAFETY MAGAZINE

FIFTY CENTS

ence In The Danger

ve page 16 for the first
rticle of the new series
n Guards for Machines.

it's NEW

it's MORE COMFORTABLE

it's RUGGED

Heavy Duty Glove

AO 5X264

Feel it, test it, wear it and you'll see why this latest addition to the AO steel stapled line is ideal for handling small castings, rough stock, grinding and similar work.

Made of specially treated chrome tanned cowhide leather for long wear, the glove features a canvas back with elastic strap to overcome hand fatigue while providing a cooler feeling and snug fit.

All seams are steel sewed and the seam along the forefinger has been eliminated for longer glove life and added comfort at this vulnerable point.

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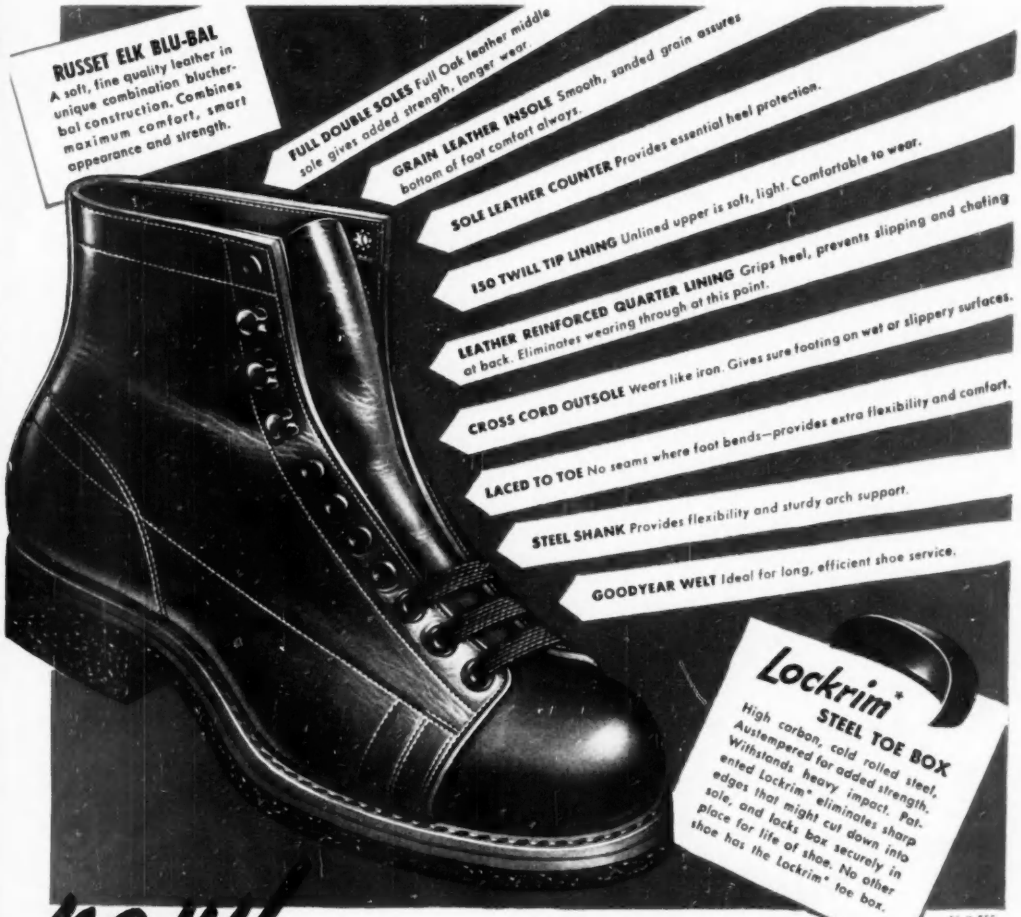
You'll lower your glove costs with the 5X264 — ask your AO Safety Representative or inquire at your nearest AO Branch Office.

American Optical COMPANY *Safety Division*

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES


RUSSET ELK BLU-BAL
A soft, fine quality leather in unique combination blucher-bal construction. Combines maximum comfort, smart appearance and strength.
FULL DOUBLE SOLES Full Oak leather middle sole gives added strength, longer wear.
GRAIN LEATHER INSOLE Smooth, sanded grain assures bottom of foot comfort always.
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LEATHER REINFORCED QUARTER LINING Grips heel, prevents slipping and chafing at back. Eliminates wearing through at this point.
CROSS CORD OUTSOLE Wears like iron. Gives sure footing on wet or slippery surfaces.
LACED TO TOE No seams where foot bends—provides extra flexibility and comfort.
STEEL SHANK Provides flexibility and sturdy arch support.
GOODYEAR WELT Ideal for long, efficient shoe service.
Lockrim*
STEEL TOE BOX
High carbon, cold rolled steel, Austempered for added strength. Withstands heavy impact. Patented Lockrim* eliminates sharp edges that might cut down into sole, and locks box securely in place for life of shoe. No other shoe has the Lockrim* toe box.
REG

new! LEHIGH'S ATHLETIC-TYPE SAFETY WORK SHOE

Here is an important new kind of safety shoe construction. Designed like an athlete's shoe, it offers greater flexibility, comfort and safety for fast-moving, active feet. No seams to pinch or bind where the foot bends. Soft, lightweight, unlined upper reduces weight and clumsiness—gives plenty of rugged wear. Long-wearing cross cord sole provides maximum traction on wet or slippery surfaces. And built into this easy-action work shoe is the famous Lehigh Lockrim* steel toe box. This new safety shoe does *double* duty on the job—actually helps *prevent* accidents because it's so light and limber...and protects feet and toes against injury. Send for a sample pair and prices today, or wire, phone or write to have a Lehigh representative call.

MEDIUM LAST • **stock no. 1310**

note: Available in widths D and E, sizes 5 to 13. Available soon—#1311. Same pattern as #1310 (above). Black elk upper with Chrotan leather outsole and half rubber heel.

LEHIGH ALLENTOWN, PA.
SAFETY SHOE COMPANY
Division of The ENDICOTT JOHNSON Corporation
WESTERN OFFICE: 4346 SAINT LOUIS AVE., ST. LOUIS 15, MO.

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The **ALL-NEW** *Safety Spectacle You've been waiting for . . .*

SAF-I-SPEC

MADE OF "OPTILITE"

RUGGED

Meets Government specifications for impact and piercing. Made of tough Optilite—optically correct safety plastic. Integral molded sweat bar gives added strength, holds one-piece lens in alignment.

COMFORTABLE

Light weight—less than one ounce per pair. Removable nose bridge made of velvet-soft Polythene. Fits everyone. No metal touches wearer's skin.

REMOVABLE TEMPLES

Patented temple attachment permits instant changing of lens. No maintenance, no spare parts needed. Saves labor . . . temples snap on and off instantly with fingers—no special tools needed. (See insert)

LOW COST

Can be worn over prescription glasses. Gives full protection, more comfort at a fraction of what you pay for safety glasses with built-in correction. Lenses can be replaced instantly, using same pair of snap-on temples indefinitely.

GOOD LOOKING

Neat, smart in appearance . . . a feature appreciated by both men and women.

TWO STYLES—all clear or all green anti-glare $1.20 each in quantities of 1 gross or more.

SAVE YOUR SIGHT WITH "OPTILITE"

A COMPANION TO THE NATIONALLY KNOWN SAF-I-SHIELD COVER GOGGLE

U.S. SAFETY EQUIPMENT & ENGINEERING SERVICE

NEW INSTANT SNAP-ON TEMPLES

Exclusive, patented feature of SAF-I-SPEC. Temples clip on or off instantly, for quick lens changes. Easily adjusted to fit any wearer's face.

UNITED STATES SAFETY SERVICE CO.

Kansas City 6, Missouri

Branches in Principal Industrial Cities

FIRE EXTINGUISHERS ARE YOUR *BEST* PROTECTION

. . . and most economical, too! Tests conducted by impartial, nationally recognized approval laboratories have proved the superiority of Ansul Dry Chemical Fire Extinguishers on ***Flammable Liquid Fires.***

In addition, Ansul Fire Extinguishers provide greater safety for the operator. The stream of Ansul Dry Chemical forms a protective screen safeguarding him against radiant heat.

More and more industrial plants, transportation companies, oil companies, etc. are switching to Ansul Extinguishers as their first line of fire defense. There is a reason . . .

Get the facts. Send for your copy of File No. 407. You'll also receive our latest literature together with comparative rating charts for the various types of fire extinguishers.

- **Safe for use on electrical fires too! Even high voltages are not conducted by dry chemical stream.**
- **Can be recharged at scene of fire furnishing continuing protection.**
- **Annual recharging is not necessary. Low maintenance costs.**
- **Longer range stream of dry chemical is effective in winds and drafts.**
- **Ansul Dry Chemical is non-abrasive, non-corrosive, non-toxic.**
- **Listed and Approved by Underwriters Laboratories and Factory Mutual Laboratories.**

ANSUL CHEMICAL COMPANY

FIRE EXTINGUISHER DIVISION, MARINETTE, WISCONSIN

DISTRIBUTORS IN PRINCIPAL CITIES IN THE UNITED STATES, CANADA, AND OTHER COUNTRIES

CORD-ON-END "ZEBRA" Soles and Heels

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of course

Third of Five

An Outstanding Product by QUABAUG

Special long-wearing and non-slip features
Made in 12 and 18 iron.

Colors
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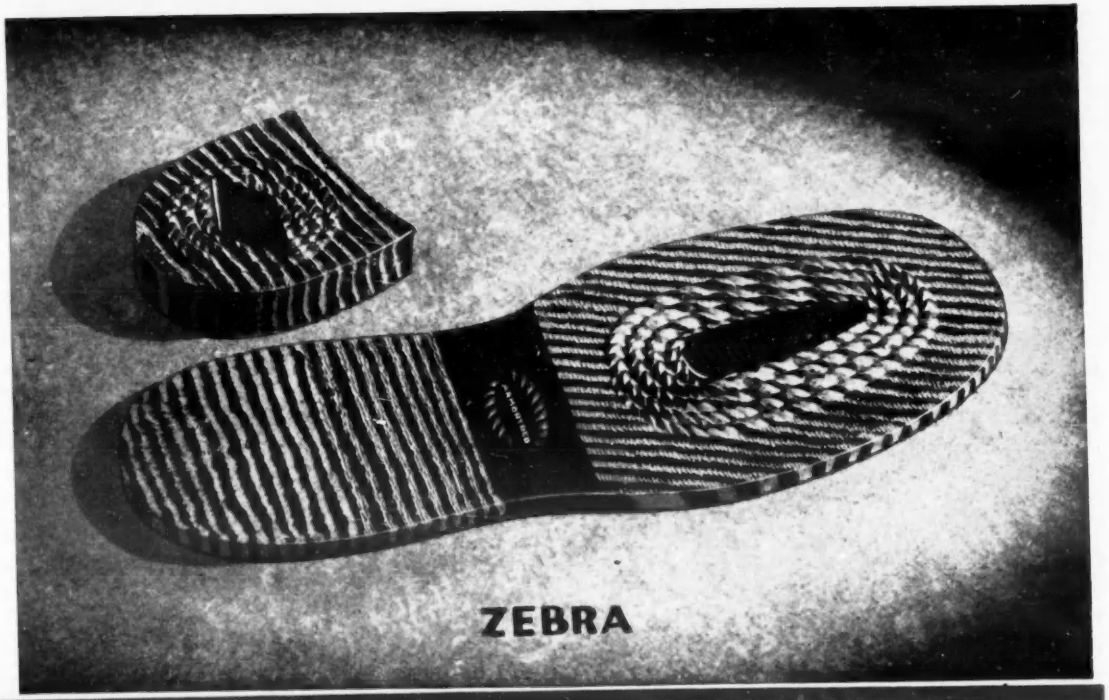
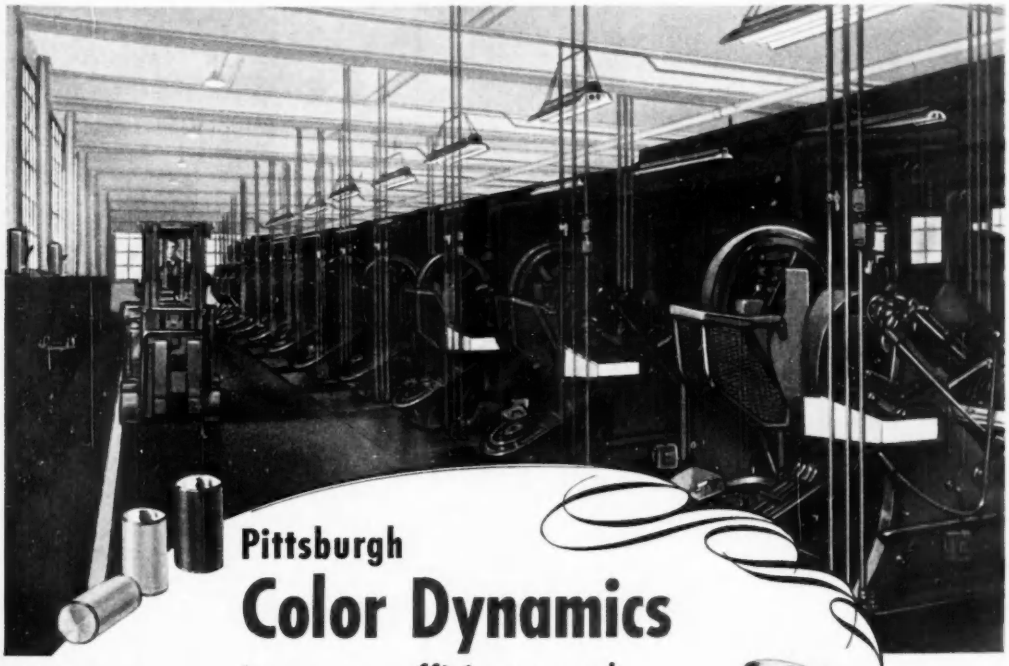
Brown Zebra
MacTavish

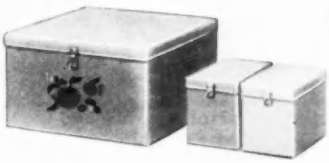


MANUFACTURED AND DISTRIBUTED BY **QUABAUG RUBBER COMPANY** NORTH BROOKFIELD, MASSACHUSETTS



Pittsburgh Color Dynamics

increases efficiency and improves morale of employees in Continental Can Company plant



Open top press room of Continental Can Company's Baltimore plant after being repainted according to COLOR DYNAMICS specifications.

PITTSBURGH can present no more convincing claim for the benefits resulting from the use of COLOR DYNAMICS—based upon the scientific principles of the *energy in color*—than these comments of John G. Murray, Eastern Division Manager of Operations of the Continental Can Company, of New York City. This company is one of the world's largest producers of metal containers for foods, beverages, and kitchenware of many types.

"We repainted our Baltimore plant, according to the principles of COLOR DYNAMICS," writes Mr. Murray. "After nearly a year's experience we find the new color scheme has reduced eye strain and physical fatigue among our employees. It has also created a more pleasing atmosphere. A better spirit among the workers has prevailed since this repainting has been done."

In hundreds of other industries production executives are similarly learning that color properly "engineered" on machines, walls, floors and ceilings actually improves efficiency and simplifies housekeeping. We'll be glad to make a COLOR DYNAMICS survey of your plant on request without obligation to you.

Paint RIGHT with Color Dynamics
Paint BEST with Pittsburgh Paint!

The benefits of COLOR DYNAMICS are made more enduring when you use Pittsburgh's long-lasting high-quality paints for every need.

WALLHIDE—available in four types: **FLAT**—a velvet-like finish that is beautiful and restful; **SEMI-GLOSS**—with higher sheen; **GLOSS**—with enamel-like sheen; **PBX**—extra-durable finish can be washed frequently.

LAVAX PBX ENAMEL—for woodwork, furniture or metal trim. Brushes out freely and easily to a smooth, satin finish.

FLORHIDE—for floor surfaces. Quick-drying, tough, can be scrubbed with soap solutions.

LAVAX MACHINERY ENAMEL—a durable finish impervious to grease, grime or dirt.

SEND FOR A COPY OF THIS BOOK!

Pittsburgh Plate Glass Co., Paint Div., Department SE-99, Pittsburgh 22, Pa.

☐ Please send me a FREE copy of your new revised and enlarged Booklet, "*Color Dynamics in Industry*."

☐ Please have your representative call for a Color Dynamics Survey of our properties without obligation on our part.

Name_____

Street_____

City_____ County_____ State_____

PITTSBURGH PAINTS

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS

PITTSBURGH PLATE GLASS COMPANY

Edward De Rocco, Aircraft Inspector,
Thom McAn wearer for 15 years.

George White, Shipyard Acetylene Burner,
Thom McAn wearer for 18 years.

George Burd, Foundry Casting Finisher,
Thom McAn wearer for 15 years.

Which of these men works in your industry?

Walter W. Schild, Machinist Foreman,
Thom McAn wearer for 26 years.

Robert Aulon, Electrical Worker,
Thom McAn wearer for 17 years.

Frank De Marinis, Crane Operator,
Thom McAn wearer for 7 years.

IN EVERY INDUSTRY . . . MORE MEN WEAR THOM McAN THAN ANY OTHER SHOE

Pictured here are six working men. They're typical of the millions in every industry who make Thom McAn America's largest selling shoe.

Preference like that makes Thom McAn popular on the job, too. Workers wear Thom McAn Safety Shoes *willingly* because they know the long wear, the safety . . . and especially the money-saving price!

Thom McAn popularity is contributing to a higher percentage of foot protection, better safety records in plant after plant. Write for details of Thom McAn's convenient 4-way plant service—and see what Thom McAn can do for *your* plant's safety record.

SOLD 2 WAYS

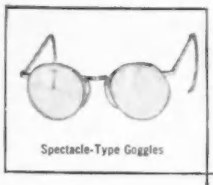
1. Sold Direct to Plants
2. Stocked for your men in Thom McAn stores.

Write for full details of Thom McAn Store Service and Plant Service Plans.

THOM McAN SAFETY SHOE DIVISION
25 West 43rd St., New York 18, N. Y.

Thom McAn
A DIVISION OF MELVILLE SHOE CORP.

MORE MEN WEAR THOM McANS THAN ANY OTHER SHOE



Spectacle-Type Goggles

Side-Shield Goggles

Plastic Frame Spectacles

Coverlite Goggles

Wide-Vision Goggles

Cup-Type Goggles

Welding Goggles

Flash Goggles

Welding Helmets

Lift-Front Helmets

Open-Top Face Shields

Air-Fed Helmets

Crown-Top Face Shields

Spark Shields

Acitex Hoods

Aprons & Sleeves

Nuisance-Dust Respirators

Toxic-Dust Respirators

Abrasive Masks

Paint-Spray Masks

Fume Kits

SEE How CESCO Meets ALL of These Safety Requirements

• When you need head, eye and body protective equipment undoubtedly there's a CESCO product that meets your exact requirements.

The CESCO line includes well over 200 safety products. Every item has been expertly developed, proved in use and meets high standards of safety equipment quality.

So, it will pay you to follow this simplified 3-step safety formula: *1*) Know your safety needs, *2*) Refer to the GUIDES TO SAFETY in the new CESCO Catalog, *3*) Use recommended CESCO protective equipment.

BE SURE TO HAVE A COPY OF THIS BOOK

CESCO's new Safety Catalog tells you where to use, how to use and how to select industrial protective equipment. If you do not have one, write for your copy today.

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The Magazine of Safety

Reg. U. S. Pat. Off.

A MONTHLY PUBLICATION DEDICATED TO ACCIDENT PREVENTION, HEALTH CONSERVATION AND FIRE CONTROL.
EST. 1901

Vol. 98, No. 3 BEST'S 50TH ANNIVERSARY YEAR
SEPTEMBER 1949

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AMERICA'S PIONEER SAFETY MAGAZINE

SAFETY ENGINEERING is indexed regularly by Engineering Index, Inc., New York

EXTRA SAFETY NEWS EXTRA

MONEY BACK GUARANTEE

another **HY-TEST** *plus!*

Certificate of Quality

$10 TEN DOLLARS CASH

This Certificate is worth TEN DOLLARS IN CASH and a *new pair of shoes* to the wearer who finds paper, paper board or any paper composition in the counters, heels, insoles, or outsoles of this pair of HY-TEST Safety Shoes.

$10 TEN DOLLARS CASH

HY-TEST DIVISION
INTERNATIONAL SHOE COMPANY
ST. LOUIS 3, MO.

...Insure Worker's Feet in Sure Protection

VISIT HY-TEST
STEVENS HOTEL, BOOTH 169
NATIONAL SAFETY CONGRESS
AND EXPOSITION
CHICAGO, OCTOBER 24-28

WRITE FOR FREE CATALOG

with HY-TEST ANCHOR FLANGE SAFETY SHOES

THE WORLD'S LARGEST SELLING SAFETY SHOE

HY-TEST DIV. INTERNATIONAL SHOE COMPANY • ST. LOUIS 3, MO. • EASTERN OFFICE • MANCHESTER, N. H.

HY-TEST SAFETY SHOES

It's Safe to Say

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★ SAFETY ENGINEERING POSTERS

BEGINNING with this issue, subscribers to SAFETY ENGINEERING are given a new service which should assist them in the prevention of industrial accidents. Each month, a colored safety poster will be inserted in the magazine. In this September issue, the poster is opposite page 20.

Safety posters have been one of the most effective educational mediums in industrial accident prevention. It is our contention that there is always room for more good posters. Anyone engaged in safety work knows that a poster should not be displayed so long that it grows stale. Yet, posters of this specialized type have been in such short supply that many organizations have found it difficult to acquire new and different ones for adequate rotation. SAFETY ENGINEERING has received numerous requests from harassed safety directors asking where they could get these aids to safety. Partly in response to these requests, partly as a further service to our readers, and partly as a beneficial step to further the cause of accident prevention, SAFETY ENGINEERING is now inaugurating this new policy.

It is hoped that industrial concerns will take full advantage of this special service, namely, that these multi-colored posters will be taken out of the magazine and put up on bulletin boards. The posters have been designed for display purposes, and every means has been utilized to facilitate their use for these purposes. The poster page has even been perforated to permit their detachment from the magazine with a minimum of effort. Additional bulletin boards are recommended.

We therefore urge our readers to use these poster-pages *as posters*. It has been our purpose to produce posters which would catch the eye and penetrate the consciousness of their viewers, which would alert employees to potential dangers, which would remind them of the precautions they should take, and which would effectively promote the cause of industrial accident prevention. No single poster will have equal appeal for everyone, but the success of any poster must be measured by the number of people who do look twice and even more by whether or not sometime, somewhere, someone fails to be injured because of it.

Incidentally, SAFETY ENGINEERING would be happy to receive suggestions for subjects which should be covered in future posters, or for the type of posters which present their messages most tellingly. The person who daily faces in industry the hard facts of accident prevention is the one who is in the best position to know those aspects of industrial safety which have not received sufficient emphasis.

We might also point out that extra posters are available in any quantity desired. The rates for various quantities are given on page 20. Insurance companies as well as manufacturers will also be interested in the new, low-cost "Best's Personalized Safety Service" announced on that page. This plan features safety posters as part of the safety material which goes out to clients, branches or other departments under the company name of the purchaser. The service relieves the buyer of the burdensome details of handling, packaging and mailing the posters and includes a copy of SAFETY ENGINEERING, a personalized safety letter and bulletin sent to the recipient as well as additional advance copies of the safety poster, all at a low-cost "safety package" price.

★ THE HIGH COST OF CIGARETTES

DEVOTEES of the "weed" may have become increasingly dismayed during the past few years over the ever-rising retail price of cigarettes, cigars and other tobacco products. They should be even more appalled at the high cost of damage that cigarettes can do, and in fact have done. It has been estimated that careless smoking caused more than 5,600 fires in New York City last year, at a total damage of $3,285,000. This was the largest single contributing factor in the city's total fire loss of about $20,000,000. This situation is not confined to New York City alone. These figures are merely symptoms of a national disease—our careless smoking habits.

Who are the careless smokers? The answer is easier than it sounds, simply because everyone who smokes is a careless smoker. Most of us would at first loudly deny such an accusation. But if the truth were known and admitted, there is not a smoker in the country who has not at some time thrown away a cigarette butt without first making sure that it was extinguished, or at some time smoked in bed, or at some time left a cigarette burning on an ash tray.

As National Fire Prevention Week approaches every smoker would do well to admit to himself his own smoking-habit deficiences. That is the first step toward safe smoking habits. Every smoker has been careless in the past. No smoker need be careless in the future.

Inadequate vision is often unsuspected until discovered and corrected. Be sure that none of your employees is being penalized by trying to work with unsafe inefficient vision like this.

Workers who are fitted with B&L Safety Eyewear, incorporating professionally-prescribed correction lenses for their jobs, have benefit of clear sharp vision like this. Safer . . . more efficient!

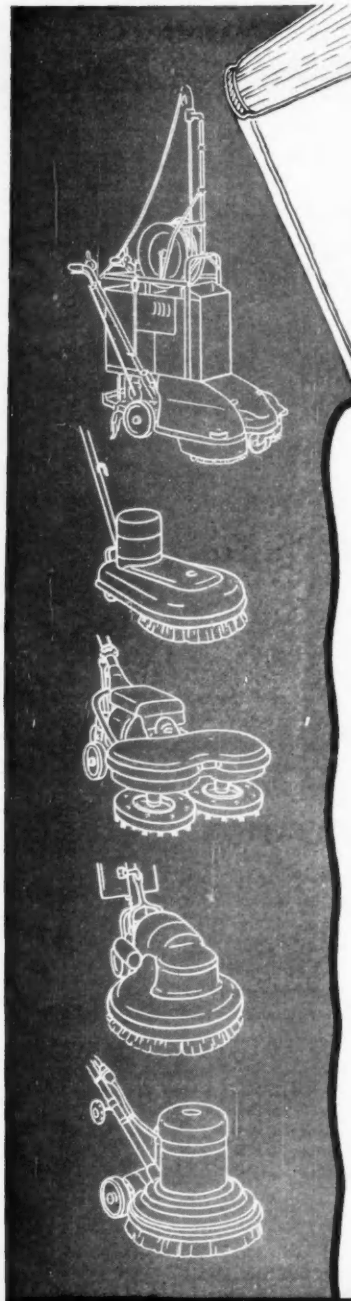
SAFE EYES?

EYE SAFETY is a TWO-IN-ONE program

Industry-wide figures show that fully 50% of workers need eyesight correction if they are to have clear vision. Without it they can work neither efficiently nor safely. Your Bausch & Lomb distributor will help you build your eye safety program on the basis of *protection plus correction. Protection* against the hazards which can cause costly eye accidents. *Correction* lenses professionally prescribed where needed. Your reward will be a better safety record and a better production record.

Write for a copy of the Bausch & Lomb catalog on industrial eyewear. It includes a highly informative discussion of the theory and design of protective industrial eyewear. It also describes the complete line of Bausch & Lomb Occupational Eyewear, the eyewear built to the highest quality standards in the industry. Bausch & Lomb Optical Co., 693-I St. Paul St., Rochester 2, N. Y.

BAUSCH & LOMB *Safety Eyewear*



WHAT *Management* SHOULD KNOW about FLOOR-MAINTENANCE MACHINES

The area of a floor, whether it is congested or open, the type of flooring and whether it is easy or hard to clean — these, among other factors, determine the floor-maintenance equipment. For most effectual, economical floor care, choose accordingly.

For large-area floors, a combination scrubber-vacuum is the labor-saving answer. *Finnell's 213-P* applies the cleanser, scrubs, rinses if required, and picks up. Has a cleaning capacity up to 8,750 sq. ft. per hour!

For small-area floors, a 13" all-purpose machine, such as the *new 713 Finnell*, is a wise choice. This machine polishes, applies wax, wet- and dry-scrubs, light-sands, applies seal, steel-wools, and shampoos rugs! Yet it is priced incredibly low.

For grease-caked floors, a dry-scrubber with powerful scarifying brushes affords the fastest cleaning method. *Finnell's 84-XR*, with its self-sharpening brushes, cleans grease-caked floors in *one-tenth the time required when hand-spudding!*

For general use, average duty, substantial savings are effected with a *100 Series Finnell* — the machine that's *two sizes in one!*

For general use, heavy duty, with emphasis on polishing needs, choose a motor-weighted machine. An *800 Series Finnell* gives 8-way adaptability! . . . has *safety switch* on handle.

Because *Finnell* makes machines for every type of floor care — and in a wide range of sizes — you can depend on *Finnell* for unbiased advice as to the equipment that's *right* for your needs. For consultation, demonstration, or literature, phone or write nearest *Finnell Branch* or Finnell System, Inc., 4109 East Street, Elkhart, Indiana. Branch Offices in all principal cities of the United States and Canada.

Everything FINNELL for Floor Care

FINNELL SYSTEM, INC.

Pioneers and Specialists in

FLOOR-MAINTENANCE EQUIPMENT AND SUPPLIES

BRANCHES IN ALL PRINCIPAL CITIES

A NEW *FIRST* by Cambridge

Rugged OIL-RESISTANCE plus Flexible Cushioning Comfort

. . . the GREATEST advance in WORK SHOE SOLES since the invention of NEOPRENE

Vul-Cork
OIL RESISTING
NEOPRENE

It's easier to
SELL YOUR SHOES
when workers see the
famous name *VUL-CORK*

GENUINE NEOPRENE OIL-RESISTANCE

plus

NEW amazing Air-Cell Processed LIGHT-WEIGHT f-l-e-x-i-b-i-l-i-t-y and Cushioning Comfort

NEW Air-Cell INSULATION. Cool on Hot Footing. DO NOT CRACK in extreme cold

NEW surefooted SLIP-RESISTANCE without need of Tread Design

NEW long-wearing Trim Edge Appearance for dressy wear anywhere . . . Do not pick up steel scraps, chips, etc.

Regular Vul-Cork **FLOATING POWER** Soles are unique for rugged — *yet flexible* — ALL-PURPOSE work wear . . . on farms . . . construction . . . delivery . . . filling stations, etc. — everywhere except where excessive oily underfooting requires Neoprene.

THE **Cambridge** RUBBER COMPANY

VUL-CORK SOLE DIVISION TANEYTOWN, MARYLAND

When good eye protection . . .

is no good at all!

This is a common sight in many plants—a condition that contributes to top-heavy accident rates, compensation costs and to lags in production.

Cover-All* Goggle Style CC60

Wearing comfort, more than anything else, will move safety goggles off the forehead on to the eyes. In Cover-All* goggles, as in all WILLSON protective equipment, comfort plays a big part in their design. The large, deep eyecups allow plenty of room for wearing prescription spectacles—and they are molded with rolled edges to fit facial contours around the eyes. The soft, leather bridge adjusts to the correct distance between the eyes and the adjustable headband provides for proper head size.

Don't fail to consider personal comfort, if you want eye safety equipment worn as intended.

DAILY REMINDERS

such as WILLSON "Blind Man" safety posters keep workers in hundreds of plants aware of the need for personal safety measures. Supplies are available on request.

WILLSON
"Established 1870"

WILLSON PRODUCTS, INC., 207 WASHINGTON STREET, READING, PENNA.

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WHY a Safety Program?

By MERVYN G. GASKIN, President,
Taylor & Gaskin, Detroit, Michigan

A contractor speaks his mind about the severe accident rate in the construction industry, how the safety record can be improved, and what will happen if it isn't.

THE answer to the question, "Why a safety program?", is that a safety program pays big dividends to all of us in cash and in a clear conscience. Aside from causing needless human suffering, accidents cost money, lost pay, and economic waste. We can estimate direct financial loss of accidents but not their full effect on human health, happiness, and the standards of living. Apart from this, however, "It pays." It pays in the lower cost of insurance, which is a part of our overhead. It pays in the preservation of our machinery and equipment because none of us wants to ruin a $25,000.00 crane or similar equipment. It pays because we are able to get more and better work from our men and a better class of labor, for they know we have their interests at heart . . . we are trying to protect their lives every minute of the day.

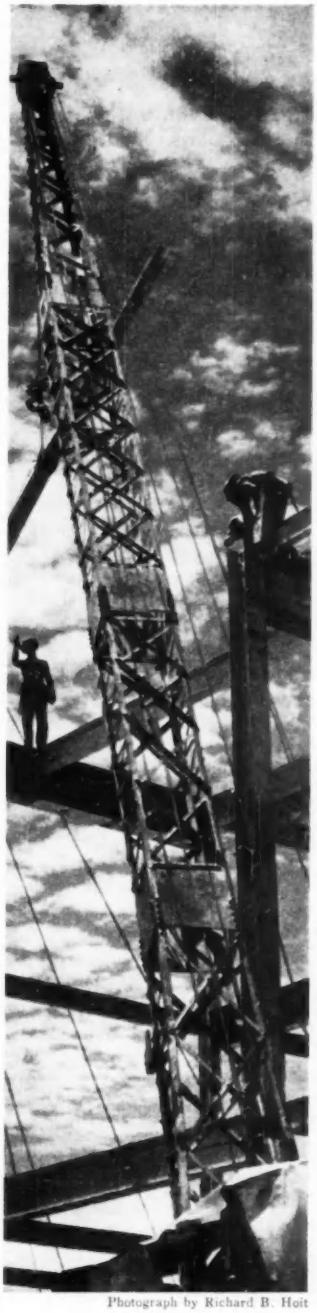
The first thing my own construction company tells its men is that if they are going to work on our job, they have to work safely and think safety. That was our motto last year, "Blueprint for Safety—Work Safely, Think Safety." It pays in our relations with our customers, as they know that we are not only trying to protect our own men, but their employees and their property as well.

Construction Has a Bad Record

Contractors are resourceful. If they have a problem, they lick it immediately. There is no set formula. No two jobs are alike. Why not apply the same principles to accident prevention? You wouldn't tolerate for very long an important decision on a matter even minutely affecting the cost of your job. One contractor told us they have meetings every week in which they check their costs to see how they are making out, and if any one part of the job is going haywire they immediately plug the leak. Why then shouldn't we do the same thing in accident prevention?

As Al Smith used to say, "Let's look at the record." We are going to talk about frequency rates and severity rates. The frequency rate is the number of disabling injuries per million man hours of exposure. The severity rate is the number of days lost per 1,000 man hours of exposure, including charges for permanent disabilities and deaths.

According to figures published in the 1948 edition of "Accident Facts" of the National Safety Council, steel erection has a higher frequency and severity rate than mining with the exception of anthracite mining, and *(To page 56)*



Photograph by Richard B. Hoit

HOW TO PROTECT

By THOMAS D. DAVIDSON, Safety Director
Sunbeam Corporation, Chicago, Ill.

What to look for in evaluating hand and foot hazards. What kinds of protective equipment are available.

MOST of us take our hands too much for granted. They are the instruments by which we make our living and they are so useful to us in the actual process of living that we become unconscious of their true merit. For each of us—whether a machinist, truck driver, writer, chemist, farmer, or safety engineer—hands play an important part in everyday existence and deserve better care than they often get.

Of immediate interest are the working hands of industry and ways of protecting them. Industrial hands have a definite monetary value, varying in the different states according to the amount of compensation that will be paid for a disability arising out of and in the course of employment. One third of all industrial injuries reported by workers involve the hands or fingers. If the innumerable cuts and scratches that are never reported (even though they should be) were added, the problem of hand protection in industry assumes major proportions.

There are other phases to hand protection, such as guarding, training in correct methods and techniques, etc., but the concern here is to be with personal protective covering. This type of hand protection falls into two classes: Mechanical, such as gloves, finger cots, pads, etc. and Creams, where mechanical protection due to some peculiarity of work operation is unfeasible. This second type is definitely limited in the scope of protection it can provide and is outside the province of this article.

Gloves and Mittens

Finger movement is necessary for most work and this complicates hand protection. Rigid covering is impracticable so protection is a compromise. Finger stalls, gloves, mittens and various types of hand covering of many materials are made to meet the needs of various jobs. The safety man should carefully analyze the hazard—then prescribe the needed protection. Generally speaking, the use of gloves should never be permitted when operating revolving machinery. However there are certain operations where because of the nature of the material and the method necessary to produce a desired result, hand covering is necessary. For example, buffing and polishing on high speed lathes where the parts become too hot to handle with bare hands.

Some of the more common materials used in hand protection are canvas, a knitted material resembling terry cloth, asbestos, rubber, duck, leather, plastics, and metal mesh, and combinations of these. In providing hand protection there are a number of things to consider; first is the glove, finger cot or hand pad comfortable to the wearer; second does it afford adequate protection; third will it interfere with production.

Very often a glove will fit the operator comfortably but under prolonged use irritation develops because of some unforeseen fault in the glove. Care should be used in selecting a glove to provide against this possibility.

Considerable study has been made by manufacturers to provide specific gloves for particular uses. Such as the handling of hot materials, liquids, or solids, rough or sharp objects, acids, alkalis, and corrosive substances.

Rubber Gloves

Electric utilities go to great length to select and to periodically inspect and test rubber gloves of specific dielectric strength for the use of line men working with high voltages. Equal care should be used in industry in selecting the right glove for protection for the particular job or operation. For example, in a degreasing operation where the parts being degreased had sharp rough edges and oleum spirits or kerosene were being used as a degreasing agent, the employee wishing to protect his hands from cuts put on a pair of canvas gloves with the result that the gloves became saturated with oleum or kerosene causing severe burns. A synthetic rubber glove should have been worn in this operation with a cheap cotton inner liner to absorb perspiration or cotton glove worn over a synthetic glove to protect it from the sharp edges of the parts handled. For most of the solutions used in industry, synthetic rubber gloves can be used satisfactorily,

FEATURE

This is the second of a consecutive series of three major articles dealing with Protective Clothing. The third feature of the series will appear in the October issue of SAFETY ENGINEERING.

THE HANDS AND FEET

but natural rubber gloves are indicated for certain types of operations such as acid handling and sand blasting.

Synthetic rubber gloves and natural rubber gloves are available in a wide variety of sizes, weights, and lengths. In the selection of this equipment, mechanical strength should be considered; pliability and the grade of material is also an important factor. In heavier industries, these gloves are also furnished with an inner lining of fabric to assure added wear and protection. For light cleaning operations, canvas gloves dipped in latex are used in many industries.

Chemical Operations

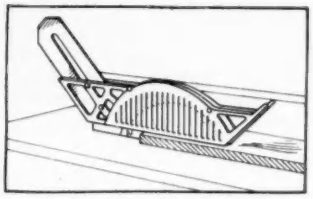
Rubber, as well as asbestos gloves, should be long enough to come well above the wrists, leaving no gaps between the glove and the coat or shirt sleeve. Long, flaring gauntlets should be avoided unless they are equipped with locking devices to assure a snug fit about the wrist. These are especially desirable in the pouring of acids and chemicals from large to small containers. In these operations, the danger of splash is present, and unless precautions are taken, harmful results may occur. Ordinarily speaking, in the pouring of caustic substances and harmful solvents from large to small containers, sleeves should be worn outside the gauntlets. In many operations, rubber gloves with extra long cuffs, have been used to advantage. The cuffs of these gloves are made with a heavy ridge, near the top edge, which, when turned back, forms a trough to catch liquids running down the wrist or forearm.

Where rubber or synthetic gloves are continuously used over a long period, a type of light weight cotton liner should be provided. Where no liner is provided it is well to provide a talcum powder to be shaken into the glove before putting them on the hand. Rubber gloves should be cleaned and washed frequently, inside and out.

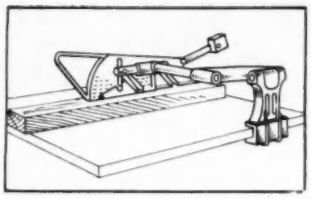
In butchering operations, such as boning and cutting, wire mesh gloves are used. These should fit snugly, and mesh should be of a fine quality to minimize the danger of penetration.

Gloves that are too large will catch on sharp, jagged objects; those that are too small will tear or be punctured very easily and employees may damage them in pulling them on or off. Provide gloves that are slightly large rather than those that are too small, as perspiration and swelling of the hand may cause discomfort and difficulty in removal.

Without going into all the different types of protective hand coverings, and protection against solids, liquids, and hot metals, generally speaking, *(To page 38)*



Typical hood for circular saw mounted on spreader.



Circular saw hood mounted on arm attached to table.

HOW TO

Most of the material in this article is abstracted from the Appendix to the American Standard Association's Safety Code for Woodworking Machinery.

THAT phase of industrial safety known as "Physical Guarding" has attained significant development over the past several decades. One important part of this development has been the use of hoods, spreaders, non-kickback fingers and similar protective devices for woodworking saws. For maximum safety, woodworking shops should use only those types of guards which conform to the recommendations of the American Standards Association in their safety code for the woodworking industry.

In spite of the fact that this guidance is available for selecting woodworking guards, accidents can continue to take their toll of lost-time and lives if the guards are not used and applied correctly. The remainder of this article offers some suggestions on how to use woodworking-machine guards correctly and safely, and also how other aspects of the plant equipment, arrangement, and maintenance can affect the safety of employees.

Push blocks should be at least $^3/_8$ inch thick if made of hardwood or $^3/_4$ inch thick if made of soft wood. Wherever space permits, the block should be at least 10 inches by 6 inches so as to give protection to the hand pushing down on the work.

In order for each operator to have sufficient space in which to handle the material with the least possible interference from or to other workmen or machines it is suggested that the following conditions be maintained:

(1) *Rip and Crosscut Bench or Table Saws.* The minimum distance or clearance on each working side of the saw table should be equal to 3 feet more than the longest material handled. In a production shop which uses jigs and fixtures, definite space either at the saw or in storeroom should be provided for storing these fixtures. It is also important in the location of a rip saw to be sure that no other employee is regularly working in line with the saw where he might be hit by material in case of a kickback. If it is necessary to locate a machine in such a position, a heavy metal or plank barricade should be erected to protect the workman.

(2) *Band Saws.* The minimum distance or clearance on 3 sides of the table should be equal to a circle with the point of operation of the saw blade as a center and a radius equal to twice the diameter of the band wheels.

(3) *Jointers.* The minimum distance or clearance should be at least 3 feet greater than the length of the longest material worked on the machine.

(4) *Shapers.* The minimum distance or clearance should be at least 3 feet greater than the longest dimension of the material worked on the machine. It is vitally important to both safety and production to protect shaper operators from interference. To this end, shaper machines should be so set that the operator faces the aisle and is protected at the back by a partition or railing.

By locating heavy-duty machinery on the ground floor, most of the vibration due to high operating speed can be eliminated. Undue vibration and noise caused by high-speed machinery may be eliminated to a large extent by cushioning the machine foundation. This can be done by inserting rubber, felt, cork, or other elastic material between the machine base and the floor beams or girders to which the machine is fastened.

It must be borne in mind, however, that the bolts that hold the machine to the foundation must not pass through or touch the girders or floor beams of building. The cushioning material must be fastened to the floor beams or girders by bolts that are independent of the machine base.

Lighting

Proper lighting is of vital importance. It is a widespread belief among men experienced in accident-prevention work that improper lighting is a factor in perhaps 25 percent of all avoidable accidents in the country. Too much is often as bad as insufficient illumination. American Recommended Practice of Industrial Lighting, A11-1942, gives values of intensities. It is also important that proper attention is given to the maintenance of all lighting equipment i.e., cleaning and adjustment of reflectors. Dust accumulated on the lamp bulbs quickly cuts down the intensity of the light. Makeshift reflectors, or those whose adjustment has been

USE WOODWORKING-MACHINE GUARDS

impaired, have a tendency to spoil the efficiency of any carefully worked out lighting system. Recent investigations indicate that the color of ceilings, walls, floors, and equipment has a definite bearing on the absorption of light and the amount of energy required for the seeing task. In general it is suggested that preference be given to colors which absorb less light and that important or dangerous parts of equipment be in contrasting color in order that they will be seen easily.

Floors

Suggestions for treatment of smooth slippery floors about woodworking machines:

1. Some manufacturers now make a paint which includes an abrasive making it non-slip.

2. If a non-slip platform, mat, or other non-slip material is placed about the machine the edges should be beveled to not more than ⅛ inch high at the point or edge of the bevel, or the floor should be recessed so that the material will be flush with the floor. Excellent maintenance to avoid tripping hazards is essential.

3. Wood chips and sawdust, particularly on top of a wooden floor, may in themselves cause a slipping or a tripping hazard. The continued rubbing or sliding of chips and sawdust over a wooden floor may also cause the floor itself to become very smooth and slippery. It is therefore important that provisions should be made for collecting chips or sawdust so that they will not get on the floor, or the floors should be thoroughly cleaned at frequent periods.

Motor Drive

The initial expense of individual motor drive is frequently higher than that of other power-transmission equipment such as line shafting, etc., but has a great many advantages. It offers a better control of the individual machine. It also eliminates overhead shafting and belting, thereby improving lighting and general appearance of shop. Then, too, it eliminates injuries due to oiling and maintenance of overhead transmission equipment.

Where there is electrical control it is recommended that hand-fed circular saws, band saws, and machines of like operation be provided with an emergency foot switch which will make it possible for the operator to cut off the power without removing his hands from the work.

Circular-Saw Hoods and Mountings

(1) Hood Construction

a. Hoods may be made of aluminum or magnesium alloy.

b. If made of plywood, they should be of substantial construction.

c. Hoods should have thin liner piece of wood at bottom of cast-metal hood to protect the saw teeth.

(2) Hood Mounting. Saws are used for so many operations that it is doubtful if any one type of mounting will fit all possible conditions. For efficiency and serviceability of the guard, mountings are recommended in the following order:

a. Hood mounted on spreader attached to throat piece (throat piece should be locked in position);

b. Other spreaders attached to frame, carriage, or table;

c. Arm mounting attached to table or frame;

d. Ceiling, side-suspension, or floor-stand mountings, should only be used when other types of mounting are impractical.

(3) Discussion of Mountings

a. If hood is mounted on spreader, it can be used even if material being cut extends beyond the sides of the saw table. But this mounting is not practical for grooving, dadoing, or rabbeting operations.

b. If hood is mounted on an arm attached to the side of the table, it can be used on most grooving, dadoing, and rabbeting operations; but this arm will restrict the size of work that can be cut on that side of the table.

c. The design and quality of materials used will also affect the amount of supervision needed to be sure that the guards are properly used. Attachments should be such that it is easy to attach the mounting the right way or in the right position, but at the same time difficult or impossible to attach it the wrong way or out of line with the saw. If counterweights are used to make it easier for the work to lift the hood, then extra supervision may be required to see that the counterweight is not altered or

FEATURE

This is the first of three feature articles concerned with Guards for Machines. The next two articles of the series will be published in the October and November issues of SAFETY ENGINEERING.

adjusted to keep the hood in a raised position at all times.

d. It will be an added advantage in some operations if the hood and mounting can be so designed that the hood will prevent the material being cut from being raised off the table by the centrifugal upward force of the saw in case of pinching or binding before material reaches the spreader.

e. For tilting-arbor or tilting-table saws the hood should be mounted on the saw frame or carriage so that the hood will remain in line with the saw when the saw or table is tilted at an angle.

f. For multiple saws such as equalizer saws, hoods should be mounted so that they will be adjusted to true alignment with the saw whenever the location of the saw is changed. When these machines are provided with individual motors for each saw, the hood should be mounted to the same frame as the motor so that it will automatically move with each new location of the saw.

Circular-Saw Spreaders

Each spreader should be shaped on the side toward the saw so it will approximately follow the curve of the saw, and should be not less than $3\frac{1}{2}$ inches wide at the level of the table. In some special cases this width cannot be obtained, but it should be not less than 2 inches.

The value of a spreader depends on its location directly behind the saw. If a saw machine is regularly used with a saw blade smaller than the maximum size permissible on the machine, serious consideration should be given to the possibility of locating the spreader within $\frac{1}{2}$ inch of the clearance of the saw blade regularly used on the machine, even though this would require moving the spreader if the machine were to be used for the maximum size saw.

The design of the spreader mounting should provide for ease in attaching the spreader in the correct location and should make it difficult or impossible to mount the spreader in an incorrect or dangerous position.

For grooving, dadoing, or rabbeting which does not permit the use of a spreader, serious consideration should be given to the use of jigs or fixtures to hold the work so that the hands of the operator are removed at least 12 inches from the point of operation.

Circular-Saw Kickbacks

Kickbacks on rip saws are usually caused by one of the following:

(1) Failure to provide spreader;

(2) Improperly conditioned saw allowing material to pinch on saw and rise from the table;

(3) Improper alignment of gauge or fence;

(4) Improperly conditioned or twisted grain lumber;

(5) Improper design or mounting of kickback dogs.

Some dogs are so designed as to be very effective for one thickness of material but have very little holding power when used on either much thicker or much thinner material. Other dogs have very good holding power but are so located that they do not come in contact with the material when it is in position to be thrown upward by the saw. For a circular saw where the arbor is above the table the rotation of the saw is reversed and it would therefore be necessary to locate the kickback fingers in front or ahead of the saw to oppose the upward thrust of the saw.

In order to use the hood guard effectively on circular rip saws when cutting narrow strips, a filister piece should be used. This should be made of wood about 2 inches wide. It should be about $\frac{3}{4}$ inch thick or slightly thinner than the thickness of the material being cut. It should be provided with cleats or brackets at the ends so that it will either fit down over the front and back ends of the table, or can be quickly attached to the fence or gauge.

Special considerations should be given to the use of jigs or fixtures when cutting irregular pieces or oblique angles. A special application of this principle is the jig for cutting wedges and pointing stakes.

Shapers

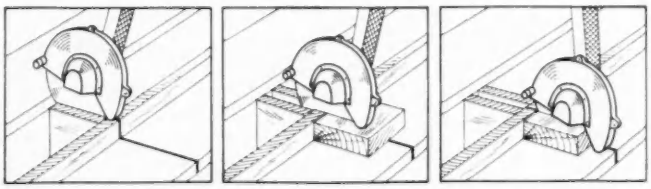
(a) Knife blades and collars for shaper heads should be precision ground so as to give uniform pressure on all knife blades and keep them from flying out while the machine is in motion.

(b) It is recommended that collars be provided with "stop-pins" and that knife blades have a recess cut in them for the pin. This is an added precaution to keep the blades from flying out.

(c) Attention is called to the desirability of incorporating an automatic brake in the design of shapers, jointers, and similar machines in order to stop the revolving heads as soon as possible after the power is shut off.

Maintenance

A large proportion of circular- and band-saw accidents are caused by dull, badly set, improperly filed, and improperly tensioned saws, and by gum adhering to saws. Such conditions cause the material to stick, jam, stall the saw, or kickback at the operator. It is strongly recommended that *(To page 43)*



Typical hood for swing saw. Left: Saw at rest or at back of table, lip of hood resting on back fence of table. Center: Saw in the cut, lip of hood in contact with material being cut. Right: At end of cut, lip of hood in contact with the table.

HOW TO SAY IT WITH SAFETYGRAMS

By W. H. WATTS

A previous article has described WHY Safetygrams can inject new life into an ailing safety program. Here are some specific suggestions on HOW to say it with Safetygrams.

SAFETYGRAMS have made a hit—a *safe* one!

Do you remember the article, "*Say It With Safetygrams*" that appeared in the December 1948 issue of *SAFETY ENGINEERING*?

In case you've forgotten, in that article was launched the idea that if you want to give your safety and accident promotion message a hard-hitting, psychological wallop—an atomic impact—say it in brief, telegraphic form with a Safetygram!

Well, we got curious, wondered how the idea was progressing, and checked with the telegraph company whose job it would be to accept and deliver such Safetygrams.

The answer? Following the publication of the article the telegraph company advises that it received inquiries from coast-to-coast. Readers expressed the opinion that the idea is super-cyclonic aside from being just plain colossal—but—*please*—have you any *sample Safetygram messages?*

Well, the telegraph company scratched its head—said—we always help out our patrons with suggested messages. For years we've been supplying suggested message texts covering birthdays, weddings, anniversaries, holidays and for special business purposes, so why not add some Safetygram texts?

So here they are, a series of texts devoted exclusively to Safetygrams. They are not only fresh from telegraph headquarters, but a number of the messages are also fresh from the heads of several readers who have already put the idea to effective use.

They are presented here in order to help you in preparing your own special Safetygrams just as they have already helped others.

How Safetygrams Can Be Used To Get Results

A. Announce your safety campaign by "SAFETYGRAM"

1. Our fall campaign to reduce accidents and promote increased safety starts September second. Full details including bulletins and posters now on way. Reports of 2,000,000 injured 17,000 killed and 91,000 permanently disabled in 1947 is sad record of disrupted lives. This drain on productive manpower can be stopped with your all-out enthusiastic support. Alert every worker to do his or her part. Please post copies of this Safetygram on all office and plant bulletin boards.
2. We must at all cost decrease accidents and promote increased safety. Your people can help by realizing that accident prevention is national duty and personal responsibility. Accidents indicate failures. We cannot progress either as nation or individuals unless we eliminate these things which interfere with our progress and well-being. Please urge all to support fully our national campaign starting .....
3. Last year fully one-third of our collision accidents were attributable to the failure or negligence of others. We have much to do to effectively eliminate accidents for which our company is wholly or partly responsible. Please post this Safetygram on all bulletin boards urging full support to our new Safety and Accident Prevention Drive starting .....
4. As a preliminary to start off our Safety Campaign starting ..... I am appointing you chairman of your ten-employee committee which is to meet monthly to examine into waste of preventable accidents. Each employee must *(To page 40)*

Eight Ways To Use Safety Posters

Don't limit posters to main bulletin boards.

SAFETY posters have been available to industry from various sources for a good many years now. Some have been very effective in making the indifferent worker aware of accidents and accident causes. Others have not been so good. Some have hit many people hard right in back of the eyes where it does the most good. Others have appealed to only a few. The single poster which will carry its message home to everyone is a very rare thing. While it is practical and desirable to appeal to as many persons as possible, the various minority groups in any industrial organization should not be overlooked either. What is needed, therefore, is a variety of posters. The subjects may be old stuff which has been presented again and again. What is important is to have a different approach and a different appeal in the various posters. For the purpose of safety posters is not only to educate but also, and possibly more important, to remind and to keep the worker alert.

Getting a series of posters which will make varied types of employees safety conscious is only the first step in a poster campaign. Almost as important as the poster itself is the way it is used. Too often those responsible for safety in a plant feel they have kept their part of the safety bargain when one poster has been tacked up on the factory bulletin board. The poster may be left there for several months, gathering dust and fly specks but failing to gather any enlivened attention from employees after the first few weeks. To use posters in this way defeats the very purpose of the poster. It bores the worker; its message fails to enter his consciousness; it reminds him of nothing; it does not alert him to an awareness of accidents or the possibility of accidents. It merely becomes a part of his environment like a calendar.

Posters on Special Subjects

To prevent posters from becoming worthless as aids to safety, they should be changed reasonably often. Some plants may find it desirable to use the same poster throughout the factory for short periods of time. By this method the cumulative effect of exposure to the same poster drums the message into the employees. This method can be easily overdone, however, if the posters are left up too long or if they are seen too often.

Better for most plants would be a series of posters all on the same subject but with different treatments of the material. Such a display of posters might be used in conjunction with a specific safety campaign, for instance a program for the elimination of eye injuries, horseplay, hand tool accidents, etc. Some plants might find it more effective to use the same poster throughout the factory for a few days, and then change them all to another poster on the same subject, continuing this rotation of posters dealing with one subject during the entire course of the safety campaign.

Some other plants will find it more advisable to have a variety of posters dealing with one subject on display at the same time. To get the maximum cumulative effect sufficient quantities of each type of poster should be on display so that every worker will see that particular poster somewhere in the plant.

General Safety Programs

Many plants do not conduct regular campaigns on specific safety problems. For this more generalized safety program, it may be desirable to have posters on special subjects in certain departments of the plant or near certain hazardous machines or processes. Here again, however, the important thing is to change the posters regularly. Otherwise the poster grows stale and the worker's safety-consciousness grows stale along with it.

The great majority of companies use posters in a more or less hit-or-miss way. Safety directors may put up two or three posters on the main bulletin board and leave them there until they happen to get tired of them. It is better to change posters on a fairly regular schedule, and it is also preferable to spread the posters throughout the plant instead of crowding them together in one

Additional Copies of the Poster on the Opposite Page Are available at the Following Prices:

Quantity	Price Per Poster
1 to 10	10¢
11 to 25	9¢
26 to 50	8¢
51 to 100	5¢
101 to 500	4½¢
over 500	4¢

Also available for Quantity Subscribers Is the New, Low-Cost BEST'S PERSONALIZED SAFETY SERVICE which sends to your clients each month:

1. **SAFETY ENGINEERING MAGAZINE**
2. **A Personalized Safety Letter & Bulletin**
3. **A New Multi-Colored Safety Poster**
4. **Additional Advance Copies of the Safety Poster**

AND the service includes complete handling, packaging, and mailing for these items. For detailed information on this safety service, contact the Alfred M. Best Company, Inc. representative in your area or write to the Sales Department, 75 Fulton St., New York 7, N. Y.

Start from Scratch

REPORT EVEN MINOR INJURIES
for first aid at once
DELAY MAY MEAN INFECTION!

SAFETY ENGINEERING MAGAZINE, New York, a 949

place. Three or four posters together detract from one another.

How, then, can posters be used most effectively? There is a tendency to consider only main bulletin boards as suitable locations for posters. There are many other ways to use them.

1. Do not overlook departmental and smaller bulletin boards. Placement here may be more effective than in crowded and conversation-infested entrances.

2. Instead of bringing the worker to the poster, try taking the poster to the worker. Have suitable frames for posters made and installed on the sides of electric or gasoline powered trucks which move around the plant and yard.

3. Many companies use buses and other vehicles for transporting personnel. Mount posters inside these vehicles.

4. Put general posters near the front of passenger elevators, so the occupants can see them.

5. Keep your eyes open for places where employees have to stand in line, such as at cafeteria entrances, tool cribs, etc. Those are the places to have special bulletin boards or poster frames.

6. Take advantage of the wall space in the cafeteria itself. Even the washroom is another possibility.

7. Have sets of posters assembled in binders and place them in the waiting rooms of the personnel office, first aid room, dispensaries, etc.

8. What are the special hazards of your plant? Is there some machine or process which accounts for a large number of injuries, even minor ones? Consult with the medical department. Get appropriate posters put up at or near these points of dangerous operation.

Refer to a new poster or series of posters in your plant publication. Of course a good poster should tell its own safety story, but you may find it advisable to enlarge on the poster's theme or relate it to specific situations in your particular plant. Give posters a boost and they will give your safety program a bigger boost.

New Instruments Needed For Atomic Power

OPERATION of the first atomic power plant probably will be limited because of inadequate development of instruments that can be used in areas of intense radiation and high temperature, David Cochran and C. A. Hansen, Jr., General Electric engineers at the Knolls Atomic Power Laboratory, said recently at the Semi-Annual Meeting of The American Society of Mechanical Engineers in San Francisco. Both engineers are working with the laboratory at Schenectady, N. Y., to build this power plant for the Atomic Energy Commission.

The biggest obstacle to development of instruments for operating and maintaining an atomic power plant is lack of instrument testing facilities. Only a few places exist in the country where the effect of radiation on materials and devices may be studied or where liquid metal cooling systems are available for instrument testing, they pointed out. And nowhere is there a combination of radiation and high temperature liquid metal such as will exist in the atomic power plant.

Testing Facilities Growing

As yet there are no demonstrated solutions to the unusual problems of applying instruments in an atomic power plant, Mr. Cochran and Mr. Hansen said, but more and better testing facilities now are being built and this should speed up development of instruments.

Instruments are needed in the plant for control and safety of plant operation; for observing the condition and behavior of the plant as its operation proceeds; and for monitoring radiation leakage in the plant to insure protection of operating personnel.

To do these jobs, detecting devices must meet requirements not found in conventional power plant applications, where the problem of a radio active zone is not present. Such requirements include extreme dependability, remote maintenance, resistance to neutron and gamma radiation, absolute leak tightness and long service.

"The grave consequences of an uncontrolled nuclear reaction make it mandatory that instruments and controls function properly and dependably," the engineers asserted. "There is nothing about a nuclear reactor that corresponds to the safety valve of a steam boiler in the conventional power plant. The nuclear reactor has a definitely limited capacity for absorbing or dissipating extra energy, so there must never be a runaway condition of the nuclear reaction." Of course, no single instrument bears the entire responsibility for the safety of the plant, it was explained, but even with a multiplicity of detecting devices and pyramiding of safety controls, the continued operation of the plant depends on all of them working all of the time.

Maintenance by Remote Control

Maintenance by remote control is necessary, they continued, since it is not possible to perform direct inspection and maintenance work on the detecting devices within the radioactive zone. When a failure occurs it may be necessary to remove and replace the instrument by means of remotely operated equipment. If the device has become radioactive in service it usually cannot be repaired after removal but must be replaced with a new unit. Where the detecting elements are very difficult to remove or are completely inaccessible, stand-by detecting elements must be installed at the time the plant is built.

Resistance to radiation is vital because pressure, *(To page 42)*

The Dollars

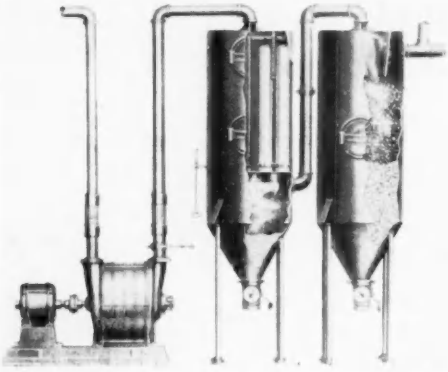


Fig. 1. A stationary vacuum cleaning system consisting of a motor-driven exhauster and two separators. At right, intake from piping enters primary separator, depositing heavier particles. Light dust passes on to second separator where the filter bags intercept it.

Dust is an almost universal industrial problem that complicates plant and equipment maintenance, product quality and fire prevention as well as the safety and morale of employees. Vacuum cleaning will get rid of dust thoroughly, efficiently and economically.

Fig. 2. Cleaning of shelves and ware on kiln car in a pottery is accomplished thoroughly and rapidly by inserting hose into inlet valve of stationary vacuum cleaning system. Efficient dust removal protects health of workers as well as providing production economies.

IT HAS often been said—"If you can't afford Safety, you can't afford to stay in business." Men responsible for safety heartily agree with this, because they know that a safe plant is an economical plant. Others may not recognize so readily the close connection between safety and economy. For instance, the use of vacuum cleaning is frequently understood to refer to maintenance operations, and results from such operations are sometimes not readily apparent in their benefit to a company, since they may not immediately show up on the financial statement. It is intended here to interpret vacuum uses for production applications in terms of appraisal of a tangible return on the cost, in addition to the other less apparent, but nevertheless important, benefits to be gained in safety and maintenance.

One common use of suction is in the ventilation or exhaust system which removes large volumes of air at low pressure by introducing vacuum. This may be either from a complete chamber as in the case of air conditioning, or removing fumes from an operation such as arc-welding and dust from a process such as woodworking through a blow-pipe or low pressure system. The design of such piping and the vacuum-producing equipment is fairly well standardized. These systems rarely have a suction of over six or seven inches of water, or about a half-inch of mercury.

Pneumatic Cleaning Systems

A more specialized use of vacuum is in pneumatic cleaning systems. These may be permanent piping installations or portable units. Their purpose is to develop a high velocity of air into a special nozzle to remove fumes, dust or other materials. Most people have had some experience with the household vacuum cleaner. Basically this does not differ from the commercial or industrial machines; but neither the domestic nor the commercial cleaner can long endure the rugged requirements demanded of the industrial type. The industrial cleaning units can operate twenty-four hours a day for 365 days with only periodic servicing required.

Of the two types of pneumatic cleaning, the stationary system of installed piping might be compared to the automatic sprinkler, *always* available when needed without having to move any equipment. The portable vacuum is similar to the wall extinguisher, flexible and often necessary, but not as powerful as the permanent installation. The stationary system consists of a vacuum producer and in most cases two dust separators. (See Figure 1.) The material picked up by the vacuum cleaning system first enters the primary separator where the greatest portion is trapped out by centrifugal action; the remainder of the material, upon entering the second separator is again subjected to centrifugal action, and the remaining light, readily air-borne dust is then trapped out of the air stream by the inverted filter bags. As filter bags intercept all dust particles, no material reaches the exhauster.

The exhauster or vacuum producer usually employed is of the multi-stage centrifugal type. By varying the number and diameter of impellers, vacuum and volumes can be obtained to suit pipe runs

and Sense of Vacuum Cleaning

Fig. 3. Heavy-duty, compact, portable vacuum equipment such as this provides sufficient suction to operate two 75-foot hoses simultaneously. Removal of dust reduces product damage, improves working conditions, eliminates hazards and provides good housekeeping for a high morale.

Fig. 4. Extraction of chips from this large casting is accomplished completely and rapidly by the two-inch diameter vacuum hose attached to the suction system. The safety of this method compared to compressed air is self-evident and its greater efficiency is also obvious.

and the number of sweepers in simultaneous operation. This type of unit is ideally suited for maintaining constant vacuum, although the air load may vary considerably. By dynamic and static balancing, quiet and vibration-free performance is insured. The bearings which support the shaft are the only parts which may wear. Since there are no internal mechanical wearing parts and no dust passes through the unit, this type of vacuum producer will give many years of continuous service with practically no maintenance and without loss of its original efficiency.

The secondary dust separator has an air inlet pipe just beneath a steel plate to which the filter bags, hanging from a shaker frame, are clamped. The incoming air deposits its dust content by cyclonic action in the bottom of the separator, then is exhausted through the bags as clean air. The bottom is cone-shaped, terminating in a rubber-seat-type discharge valve. Sometimes, rotary valves are used for constant discharge of the collected material.

Separators are located to provide for easy disposal or reclamation of the collected material as may be indicated by plant requirements.

The piping can be fabricated using standard black steel pipe and cast iron drainage fittings threaded without pitch, with welded pipe and fittings, or, under certain conditions, tubing or conduit may be employed. Spring closing inlet valves are located where needed to permit cleaning all areas with a maximum of 50 ft. of vacuum hose. The sweeper can insert hose into any valve and clean an area of 25 or 50 ft. radius. In one pottery, where the hazard of silicosis is ever-present, the vacuum system was installed primarily to clean kiln cars before entering the furnace. (See Figure 2.) The saving of only one percent of refiring of sanitary fixtures would pay for its cost in six months, without considering the benefits to health and maintenance.

Hazardous Overhead Dust

For plants where most of the cleaning involves the removal of overhead heavy dust accumulations, it is necessary to have large collecting capacity and ample suction, as well as some flexibility. A desirable combination may be made by providing the usual permanent system with a special base. In this way the entire unit may be mounted on a flat car or truck, or carried by a crane for overhead work. Two or more operators may work simultaneously, each using 100 ft. of hose, to reach otherwise inaccessible places. Breakdowns caused by dust deposits and occasional product damage from dust accumulation on beams can be prevented. Some plants only clean their superstructure at rare intervals. The usual procedure is to brush or blow deposits down to the lower levels, then sweep up the material. The blowing creates a most hazardous

FEATURE

This is the fourth of a series of five major articles on Plant & Building Maintenance. The fifth article of the series will appear in the October issue of SAFETY ENGINEERING.

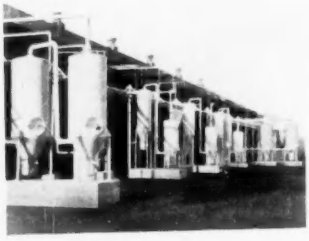


Fig. 5. Battery of specially-designed separators in a vacuum installation. These are standard equipment used at ordnance plants for collection of hazardous military explosives and chemicals.

condition and never results in complete cleaning.

Operating conditions may require a portable vacuum cleaning unit. These industrial machines vary from a medium duty 1½ HP operating twenty-five or thirty-five feet of hose to the larger 5 or 7½ HP tool which can supply suction for two 75 foot hoses simultaneously. (See Figure 3.) The choice of the portable vacuum cleaner depends on many factors: storage capacity, length and number of hoses which must operate efficiently, area to be served, aisle width, type of dust to be collected, etc.

Cast iron chips from machining operations are easily picked up by heavy duty vacuum units. This refers to the dry types, not the stringy or oil-laden chips, neither of which will freely enter the nozzle or hose. More readily cleaned is the steel shot or grit from intricate castings. (See Figure 4.) The steel shot is salvaged and, by the use of proper tools, complete extraction of dust is possible. At one of the motor manufacturers, castings had always been blown out and small chips found refuge in recesses only to reappear during subsequent assembly of the component parts. The cause of variance from allowable tolerances was not discovered for some time. By replacing compressed air with suction this cause for rejection has been eliminated.

In plants where painting is contemplated, dust must first be eliminated before a good job can be done. Removing lint, rock wool, webbing, caked dust, scale, etc. from the walls requires special tools. After painting has been done, it is even more important to keep the surface clean, since it is dust that inhibits the paint and causes deterioration. This action has a marked rusting effect on galvanized sheathing which forms the walls of many factories. If $6000 is needed every three years for repainting, and if by the periodic cleaning of these surfaces every six or twelve months, the same paint job need only be done every five years, a saving of $4000 can be effected. This is sufficient to buy two or three big portables or a 20 to 30 HP stationary system without considering many other uses for the equipment.

The Fallacy of Broom Sweeping

Floor vacuuming is far superior to broom sweeping. A recent test was made in one plant to compare results from both. With vacuum cleaning 35% more dust was picked up than when brooms were used. With the brooms and brushes this 35% was scattered and resettled on the floors, walls, and overhead to present a secondary cleaning operation. Another instance of the economy and efficiency of vacuuming is that of one plant which used four men to sweep the factory in an eight hour day. After installing a stationary vacuum cleaning system throughout the plant, only two men were required and these two did the job in six hours.

At refineries where "cat-cracking" units are operating, one of the problems is to remove catalyst, particularly the bead-type known as "Thermafor," from the many levels. Vacuum, as used at such plants, is ideal for the removal of this extremely hazardous (to anyone walking on the beads) material. Collection and salvage from floors, elevator boots and pits make such an installation quite profitable.

One of the principal causes of accidents is a dirty working surface. The plant which has good housekeeping minimizes these injuries and accidents both in degree and number. A 20' x 30' crusher room into which the 2 inch hose from a permanent system was taken, after half an hour of vacuuming produced a clean chamber, revealed several goodsized tools which had been lost, and rediscovered two switches which had disappeared from sight.

Explosive and Toxic Dusts

Explosive and toxic dusts from chemicals or ammunition impose serious fire as well as health hazards in many cases. Stationary systems have been installed at many plants to free operations from such hazards. (See Figure 5.) Ordnance plants have very rigid specifications for the construction of the tools and collectors, the class of electrical equipment, and the material for the filter bags. As a result, explosions and accidents have been eliminated. An interesting process is the removal of bursting charge explosives from rejected shells. Done on a lathe with a vacuum nozzle attached to the cutting edge, the material is entirely removed and conveyed to the collectors. This is just one of the many production applications that are made safer, quicker and more economical by use of specially engineered vacuum dust removal systems.

If vacuum is to be applied to a certain operation, to achieve its purpose it must be sufficiently strong, and the tools to perform the job must be carefully chosen. Engineers who are qualified to assist in analyzing projects involving vacuum should be consulted. The experience of a consultant in planning, ordering and assisting in installing and demonstrating the use of such equipment is invaluable in getting a flexible, but efficient solution to suction problems.

Hundreds of industrial plants that in the beginning put in heavy duty industrial vacuum cleaning equipment to take care of a hazardous dust condition have found that in systematically doing their cleaning by this *(To page 55)*

SKIN *more precious than China!*

Yes, workers' hands are more precious to industry than all the rare china in the universe. Production efficiency and profits hinge on their healthy condition. Unfortunately, like china, these hands are readily vulnerable to damage . . . the skin must be protected against the dangerous effects of specific industrial and chemical irritants in every plant.

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A specific scientific formula to combat practically every type of industrial dermatitis. Rubbed gently into the skin before exposure, each ointment forms a smooth, lasting "invisible glove" of protection.

West will be glad to help plan an effective dermatitis prevention program for your plant. WRITE US TODAY!

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How To Prevent Injury Through Accident Prevention Programs

By DONALD MONROE, Safety Consultant, New York City

Prevent the accident and you prevent the injury. A fresh approach to simplified safety planning, with emphasis on human relationships.

Donald Monroe specializes in the prevention of injuries due to human failure.

IF YOU are *entirely satisfied* with the results of your present accident prevention program, you may not gain much inspiration from this article. But who is to say that he is entirely satisfied? The material presented here has been prepared for the benefit of the man who has recently been given responsibility for safe operation—also for the man or woman whose safety job must be shared with other time consuming duties—and possibly for the "old-timer" looking for a rejuvenating slant on his activities.

Men just starting in safety work often try to find a ready-made set of procedures that can be lined up and then practically forgotten. A magic formula to prevent accidents would be simply wonderful—even better would be a law to prohibit injuries. Unfortunately no "prefabricated" plan exists on which a safety man can "lean." He is doomed to do the job himself—eternally!

An accident prevention program (Webster) is "a course of action prepared beforehand" the purpose of which is to "hinder, impede and obviate"—"an event which is unexpected, the cause of which is unforeseen." Definitions are usually boring, but necessary. You've got to understand the basic idea of a discussion. In other words: since an accident is an unanticipated *event*, an accident prevention program must be organized to establish *conditions* that will reduce the likelihood of things happening that might result in injury or damage.

In a nut-shell: Make it *easier* to do things the *right* way!

Naturally safety programs will vary according to the needs of each plant. A program may be as highly organized as in the public utility companies, where they have detailed specific rules and instructions for every type of work their men are called on to do. Or at the other extreme a "program" may be nothing more than the simple determination of the safety man to make a daily tour of inspection. Some plants have an involved "credit-point" system for determining the "safety standing" of each department for the issuance of awards. Some plants endeavor to maintain "safety awareness" by creating a carnival atmosphere with decorations and ballyhoo. Whatever the plan may be: if it works, it's good!

At a recent foreman's meeting in a plant re-organizing its accident prevention program, one of the men asked "How are we going to find time for Safety? We're up to our necks in our regular work!" The erroneous attitude toward safety—that it is something apart from the regular job—is a very common one indeed. Experienced safety men know that when a man does his own particular job efficiently, he must do it safely as a matter of course.

Mechanical and technical safeguards have reached such a high degree of effectiveness, that "injury due to mechanical failure" constitutes a very small proportion of all injuries. No one will deny that the one big group of injuries that makes the services of safety men so important, is "injuries due to human failure."

One very large organization during the past year had a noticeable worsening of its safety record. One of the top executives had been placed in charge of industrial relations with jurisdiction over safety. This executive has an engineering degree and an understandable (if not justifiable) conviction that only a trained engineer can do a good safety job. He replaced and demoted several men who had been doing a good safety job with men holding degrees in their branch of engineering. It wasn't because these new appointees were engineers that the atmosphere in their divisions became less conducive to safe operation. It was because they lacked important human qualities. The error in reasoning was simply the emphasis on technical understanding rather than hu-

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FEATURE

This is the third of three feature articles on Educational Aids to Safety. The first two articles, dealing with training films and accident prevention signs, appeared respectively in the July and August issues of SAFETY ENGINEERING.

man understanding.

Actually few individuals ever have sufficient breadth of experience to take full responsibility for technical safety in any industry, as that would include development, operation and maintenance. Safety has to be regarded as a definite part of the responsibility to be assumed by the men in charge of each phase of operation.

Two extremes in attitude are to be avoided by men responsible for safety. The negative extreme is to be agreeable passively to whatever management is willing to do to promote safe operation. The positive extreme is to act as though the entire business is being run for the benefit of the safety department. A healthy middle ground is not hard to find.

The needs of safety are factual. Inspection shows certain physical requirements—specific injuries call for specific safeguards. A written recommendation is made which is either accepted or rejected. If rejected, the safety man must review and revise the requisition, and persist until whatever he knows to be necessary is granted—rather than enjoy the dubious satisfaction of being able to say "I told you so!"

Safety work can lead to constructive developments in production. When machine guards are under consideration, the operator, foreman, plant engineer and time-study man can be brought in to review the operation in question. This procedure often leads to simplifications that may even cancel the need for the guard.

The most important stabilizing influence exerted by the safety man is in the field of industrial relations (but that is another story). He is in a position to learn of potential disturbances, before they reach the critical stage.

Before suggesting specific program recommendations, let me describe a plan in use by a major corporation. The plan has a number of weaknesses, but for our purpose observe how it approaches safety as something apart from the regular job. A procedure has been set up requiring supervisors to spend a few minutes every week with each workman in their department discussing safety. The Executive Safety Committee determines the "topic for the week." The supervisor must fill out a report form listing the workman's name, how long he talked with him, and comment on the discussion. Offhand a top executive would (and did) say that this is a beautiful way to keep employees "safety conscious." Perhaps it is—up to a point. That point is the human factor. Supervisors are usually busier than executives. Pressure of work often makes it necessary to choose between the many things that need doing. Since the reports of these talks must positively be turned in, the temptation exists to fill in the forms "by inspiration." This possibility has even been anticipated and a system of "spot checking" is part of the plan. The corporation is devoting productive time to divert the worker's attention away from his own job—toward safety (?).

Tragedy of Omission

The safety director of a bottling plant requisitioned a "walk-over" at a point on a conveyor, where employees had to bend low to pass under. The requisition was "held in abeyance." Several weeks later the safety director's foresight was vindicated at considerable cost to the company, when an employee sustained a head injury requiring 16 stitches. Needless to say the "walk-over" was promptly approved. This is an example of what might be called a "tragedy of omission."

The responsibility of management covers a lot of territory. Stockholders demand profit, customers expect quality and service, and employees are entitled to consideration. There is no denying that management has a lot on its mind, and since management is only human, it responds readily to the greatest pressure (first things first), and matters pertaining to safety are often given less consideration than they deserve.

Murder is a serious charge, and yet when a man dies from a cause that could have been prevented it is none-the-less a tragedy—a tragedy of omission. By the same reasoning, any injury that could have been prevented is *(To page 54)*

Typical Notice for Safety Committee Meeting

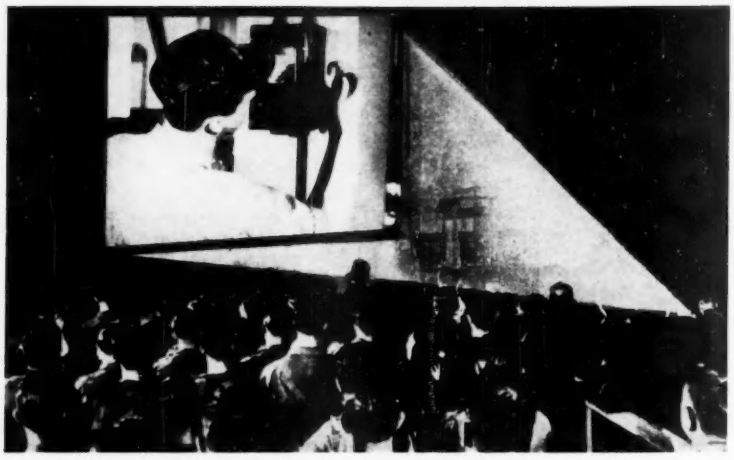
To _____

From _____

NOTICE AND AGENDA
GENERAL SAFETY COMMITTEE MEETING

Monday, Oct. 24, 1949 3–4 P.M.

3:00	**Meeting called to order.**
3:00 to 3:05	**Comment and suggestions based on Injury Data Sheet and injury break-down sent to department heads.**
3:05 to 3:10	**Report of Sub-Committee on Personal Safety Equipment.**
3:10 to 3:15	**Special report on Car Loading Operations.**
3:15 to 3:35	**Talking Motion Picture.**
3:35 to 3:50	**Main Discussion "Safety Publicity"** **a. Report of sub-committee** **b. Open discussion**
3:50 to 4:00	**Discussion to determine which safety problem is to be taken up at the next meeting—Fire Prevention—First Aid and Foreman Training—other subject of general importance.**
Enclosure:	**Injury Data Sheet**



For greatest effectiveness, integrate visual training aids into your safety program.

USE MOVIES RIGHT

By LYNE S. METCALFE

AT A time when production still is a major factor in most industries the people who are responsible for it are constantly on the lookout for ways in which to reduce the incidence of accidents. The reason is that accidents of all kinds are primary factors in the production rate. And in many a factory, plant, workshop or mill the success of the management's safety program is a good measure of the efficiency of its industrial relations program.

Industry for years approached the safety problem largely from the standpoint of preventive measures and rules of physical safeguards on property, facilities and equipment. More and more, however, stress is being laid on education—getting the individual worker into a frame of mind where he or she will habitually "play it safe." It is easy to see that progress has been made in safety education in most industries and commercial lines as well as in transport in all its phases. Techniques and methods have been brought to greater efficiency. Studies have revealed weaknesses and proved strong points. Leadership in aisle, workroom and building has been raised in quality. Along with this, greater use is being made of visual aids, particularly with films of various kinds and many factory programs are now reaching into the homes of the workers and nearby streets and highways with the help of this medium.

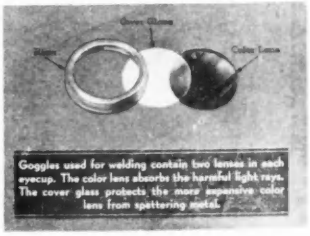
Employers feel today that every trained worker is an asset and that bad safety habits outside are just as costly to the shop as accidents on the job. Let us survey very briefly the present-day field in which visual aids are being integrated with safety education programs in the workrooms and on work properties as well as in the community and homes.

Types of Films

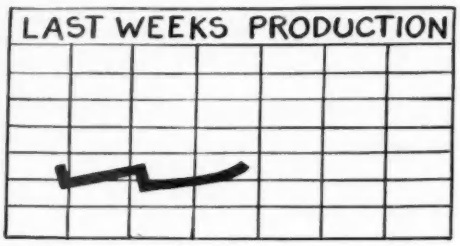
There are of course numerous motion pictures and slidefilms dealing with all phases of safety —safety in the home, in the factory, in travel, on the highway, and at the machine. These films fall into several groups insofar as the safety education student is concerned.

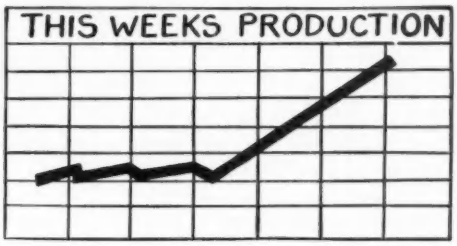
Many of those interested in safety education will say, "There are several types and kinds of

Movies are available showing the construction and uses of industrial safety equipment as well as safe working techniques and machine methods.


Cover Glass
Color Lens
Goggles used for welding contain two lenses in each eyecup. The color lens absorbs the harmful light rays. The cover glass protects the more expensive color lens from spattering metal.

Slide films can be used to explain simply and clearly the "why" and "how" of safety equipment.





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You are skeptical? Then consider this logic: The more U. S. Savings Bonds an employee holds, the more secure he feels. The more secure he feels, the greater his peace of mind—the more contented he is with his job. Results? Less absenteeism, less labor turnover, fewer accidents. *End result: increased production.*

And you needn't depend on theory alone. For those company benefits of the Payroll Savings Plan are borne out in the experience of more than 20,000 companies promoting the Plan.

LONG-RANGE BENEFITS, TOO

Bond sales spread the national debt, thus increasing our national economic security. And, of course, what's good for that is also good for you and your business.

The individual Bond Buyer gets back $4. when his Bonds mature, for every $3 he invested. That's a boon for him, and—multiplied by millions of Bond holders—represents a huge backlog of purchasing power that will help assure national prosperity through the years ahead.

IT'S EASY TO BOOST PARTICIPATION

1. See that a top management man sponsors the Plan.

2. Secure the help of the employee organizations in promoting it.

3. Adequately use posters and leaflets and run stories and editorials in company publications to inform employees of the Plan's benefits to them.

4. Make a person-to-person canvass, once a year, to sign up participants.

These first four steps should win you 40-60% participation. Normal employee turnover necessitates one more step:

5. Urge each new employee, at the time he is hired, to sign up.

Nation-wide experience indicates that 50% of your employees can be persuaded to join—without high-pressure selling. All the help you need is available from your State Director, U. S. Treasury Department, Savings Bond Division. He is listed in your phone book.

The Treasury Department acknowledges with appreciation the publication of this message by

SAFETY ENGINEERING

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council.

film. What type is best for safety education?" To find the answer we must first consider the *purposes* of the various types of films to see how each may suit a given phase of a particular safety education program.

MOTION PICTURES: Designed to bring experiences to the individual's attention, analyze safety functions, appeal to the emotions, portray dangerous situations.

SLIDEFILMS: A series of still pictures on 35 mm safety motion picture film. Two types—silent discussional, and sound, with accompanying disc record—are widely used in safety work. They are used where it is not essential to show motion, and they present clearly a series of ideas without action. Discussional slidefilms are best for teaching how-it-works and how-to-work-it safely. In the case of the sound slidefilm, the record can carry the commentary, thus making it unnecessary to have a speaker in person before each group.

SLIDES: Films of the various types are not the only "visuals" however. Miniatures, glass slide models, and "mockups" have been widely used for teaching many phases of safety education. Such visuals do very well for small groups of employees or for individual study. They provide a realism which the film approaches but doesn't equal. Also there are still pictures, projections, reliefs and an endless variety of devices and methods of showing where danger may wait.

Integrating Films with Safety Programs

Now, let us consider the integration of these various types of visuals with established or newly planned safety education programs. One organization, which in the past thirty years has become a leading producer of safety education films, supplies considerable data on this subject. This data comes from actual experience of its clients including those who use standardized films.

It is the belief of this organization that all types of films, as outlined previously in this article, have a place in safety education. Much will depend, according to the organization, on what the particular problem is in a given shop or plant and the nature of the correlated safety education program.

It may be said, however, that safety slidefilms, with sound or without, are shown *in connection with* (a) talks (b) round table discussions and (c) foreman's schools. They may furnish the basic material for discussion or meetings, or may simply amplify and accentuate basic principles in supplementing particular local shop practices. (Such a series is the sound slidefilm "Safety for Sale").

Slidefilms are also used as "refresher" material. At regular intervals foremen or supervisors are given a repeat showing of the films with accompanying discussions and reading material. The films are also used to induct newcomers into the safety principles which prevail in the plant. Glass slides serve similar purposes.

Motion pictures tend to put the worker into a receptive frame of mind regarding the whole subject of safety and protection from accidents. They make him constantly aware of such hazards through habit. This is the primary function of the safety motion picture.

In other words the motion picture is designed to awaken the worker and to inculcate the safety "habit" while other media and methods are intended to show the "what" and "how." On the other hand, some programs, especially in large organizations, merely train foremen and supervisors, letting the education trickle down to the individual worker through hour-by-hour supervision.

Typical Safety Meeting

Others carry the educational material right down to the individual employee. In some instances, both methods are combined. Following is the program of a typical safety meeting in which a sound slidefilm is integrated:

1. Introduction of subject.
2. Projection of film with record.
3. General discussion of main points made.
4. Projection of film only (no record). (Pause for discussion of high points).
5. Quiz period. Questions asked and answered at random bearing upon the material to test attention and memory.
6. Substance of information on the films passed around in printed form for re-study at leisure.

In the case of sound movies, such meetings usually lead off the entire safety education program. They set the pace, show *why* the program is being projected and stress its importance to the individual employee.

The employer interested in stepping up his safety education program with visual aids may have films produced to suit his particular needs or may utilize films already available that deal with basic and approved principles of safety today.

As previously mentioned it is becoming common practice for employers to carry safety education into the home of the worker, and into his street or traffic experiences. To this end a series of sound motion pictures "Traffic Safety" has been produced under expert supervision. Employers are working them into regular safety programs and families are permitted to participate in this phase of the educational work.

However, few users of visual aids in safety education contend that films alone will provide a complete program. But, they can be successfully correlated with posters, dodgers, exhibits, talks and speeches. They must be used properly to be used with full effect.

Pictures by courtesy of The Jam Handy Organization.

ARC WELDING — SAFELY SPEAKING

By W. W. REDDIE, Welding Department,
Westinghouse Electric Corporation,
Buffalo, New York

How to use arc welding equipment safely
How to protect welding operators
How to prevent fires during welding

THIS article concerns itself only with electric arc welding and not with gas welding or cutting. It will deal practically with safe practices in construction and installation of equipment and in the execution of the work, which, if followed, will surely contribute to the elimination of accidents.

Although much of the literature on welding is written from the viewpoint of hazards, arc welding is not essentially a hazardous process. There are, however, factors in the practice of arc welding, which, when properly dealt with, will establish this process on a high level of safety among industrial processes. When these factors are neglected, accidents can and will happen.

Arc Welding Machines

First, let us refer to the machines or "Welders," as they are commonly called. These may be either direct current or alternating current. Direct-current welders consist of a generator with ampere and voltage characteristics suitable for arc initiation and maintenance, driven by a motor, or, for locations where electric power is not available, by an engine, either gasoline or diesel.

Alternating-current welders are of the two winding air cooled transformer type with secondary (output) characteristics suitable for initiating and maintaining the arc.

The National Electrical Manufacturers Association has, over a period of years, developed standards for electric arc welding machines and kept these up to date as new developments or practices became established. These standards cover established practice in ratings, basis of rating, methods of test and broad overall principles of construction contributing to safety.

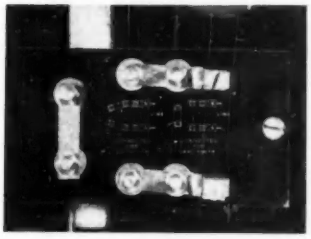
These machines are subject to extremely hard usage indoors, and with little, if any, added protection outdoors, and rarely receive expert attention. In many installations, production requirements call for portable machines, which may readily be moved about on their own running gear without the use of cranes. Consequently, unusually rugged construction, with relatively light weight is required.

The National Electrical Manufacturers Standards establish the industrial ratings of arc welders, both alternating current and direct current, on the basis of 60% and 50% duty cycles. In the case of the a-c transformer type welders, a 3rd class is added, which is known as the limited input welder.

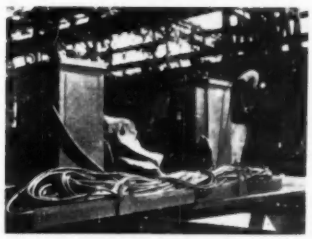
The 60% duty cycle machines covering ratings 200 amperes and over are usually heavy duty welders. The 50% duty cycle machines, ratings 200 amperes and below, are intended for lighter welding operations, which usually do not involve continuous welding service. The limited input welders are primarily for use on single phase circuits of limited capacity such as are found serving small shops, service garages and farms.

The 50% duty cycle and limited input welders are essentially portable machines in that they are not used in a fixed location and, in general, not even in a fixed area. Consequently, standard practice is to provide these machines with primary service cable and fittings and with complete sets of welding accessories. Further, since they are generally used in locations and in shops where expert supervision is not available, they are usually listed by the Underwriters' Laboratories, Inc. D-c welders and a-c welders in the 60% duty cycle class usually go into the industries where good supervision of installation and operation is available and, consequently, these machines are not listed by the Underwriters' Laboratories.

In addition to following recognized standard practices, the manufacturer can do a great deal to contribute to safe operation of the equipment through careful attention to details of construction, such as terminal markings, *(To page 47)*



Clear and concise markings on primary terminal board of a-c welder aids in reconnecting. All supply terminals should be so arranged that a tool is required to gain access, and only competent persons should change the connections.



Assembly of two 500-amperes welders into portable unit for outdoor work. Safe practices features include lifting eyes for crane handling, space for coiling down of unused portion of welding cables, automatic open-circuit voltage control, primary connections through a breaker and a three conductor primary cable containing two power conductors and grounding cable run back to service connection.

TRANSPORTATION

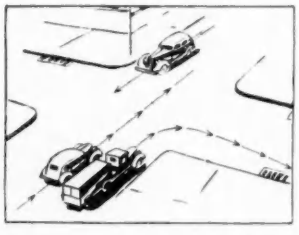
Driving Tests

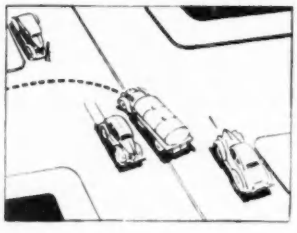
FOUR Pontiac, Michigan, automobile transport firms cooperated in sponsoring a series of driver distance reaction and brake tests in Pontiac on June 25.

The tests were carried out as part of the accident prevention program of the Fleet Carrier Corp., Pontiac, in conjunction with the National Automobile Transporters Association's accident prevention division's activities. Other auto transport firms cooperating were Contract Cartage Co., F. J. Boutell Driveaway Co., and Motor Car Transport Co.

Equipment used in the tests, in which 120 drivers took part, included a transit bus, loaded and empty haulaway trucks, saddle-mounted trucks, pick-up trucks equipped with tow-bars, and a passenger car. Much valuable research data was secured from the tests, according to Elmer R. Reeves, director of the NATA's accident prevention division. It was learned, for example, he said, that the average driver reaction time was three-quarters of a second. Reeves also said that a heavy rain during the early part of the test, provided an opportunity to gauge stopping distances on both wet and dry pavement.

Right and Left Turns





The Importance of Correct Position on the Highway.

THERE are exceptions, but, in general, on *right hand turns*, the courtesy of getting well over to the right side of the road so that following traffic can pass on your left, and on *left turns*, the courtesy of getting well up in the middle of the road so that traffic can pass on your right, *makes for safety*.

When such consideration is shown for following traffic, permitting it to pass easily on the side *away from the direction in which you wish to turn*, there is no tendency for this traffic to cut you off or try to, and your turns can be made with safety and ease. Carry this thought one step more; make it difficult or practically impossible for following traffic to pass you on the side *toward which you are going to turn*.

The size of a car or truck is so great compared to the size of a hand or directional signal that a car driver coming up fast behind you either may not see your signal or may ignore it, and attempt to pass because he sees a path to get through. The turning of your car or truck suddenly shuts off his path and collision results; hence, the great importance of guarding your turns by *correct position* on the highway.

Pictures and rules by courtesy of "Motor Vehicle Driving Practices" of The Atlantic Refining Company.

For Safety's Sake

KEEP on the right road . . . Be Courteous . . . Be Safe! warns a recent issue of the "Mack Bulldog" in setting forth some driving rules for employees of the Mack-International Motor Truck Corporation.

Building public goodwill for the trucking industry is an important part of every truck driver's job. And, it goes hand and hand with safe driving. For a courteous driver is a safe driver.

Here are 17 rules, that if observed will result in (a) greater understanding of the truck operator's problems by the general public; (b) protection of your employer's (or your) investment; (c) longer and healthier life.

- Do not tailgate—Maintain 250 feet spacing to permit any other vehicle or combination to overtake and cut in ahead of your vehicle or combination.
- Do not straddle traffic lanes.
- Do not go down a grade faster than you can go up the same grade.
- Permit passing on upgrades and downgrades (see #1 above).
- Help motorists in distress.
- Avoid all forms of illegal parking.
- Drive with extra caution in narrow streets.
- Watch out for school children and careless pedestrians.
- Use your horn as a warning only.
- Dim your high beam headlights when meeting other vehicles in the dark.
- Drive, at all times, so that you can bring your vehicle or combination to a full stop within the assured clear course ahead.
- Watch your rear view mirror. If you are holding up vehicles

behind you, pull off the pavement and stop if necessary, to permit them to pass.

- Drive, at all times, as if the car ahead or the car behind contained the Governor of the State and the Assemblyman and Senator, whose votes could determine the fate of every favorable and unfavorable measure affecting motor trucks.
- Observe all State Laws and respect the Laws of Nature regarding momentum, deceleration, centrifugal force and gravity.
- Get in the proper traffic lane before making a turn. Give the proper signal to other drivers and stay in your own lane while making a turn. Do not encroach upon the lane of traffic going in the opposite direction.
- Do not exceed your Maximum Gross Vehicle or Gross Combination Weight Rating for which you are licensed. You may be forced to unload the excess and leave it alongside the highway.
- Drive courteously, safely and within the law and thus uphold the best traditions as a "Gentleman of the Highway."

Dark Streets Dangerous

DON'T make the mistake of thinking you're safer in night traffic just because the traffic is lighter! That mistake may prove fatal!

Actually, night traffic is much more dangerous than daylight, even though only a third as many vehicles are operating. Proof of this lies in studies just completed by The Street and Traffic Safety Lighting Bureau of reports from 14 states covering 353,659 accidents for which light conditions were reported.

The Bureau said its study shows dark hours 38 per cent safer than daylight in respect to *total number of accidents* but 40 per cent more dangerous when *fatal accidents* are taken into account. This means you are much more apt to be killed in a night accident than in one that happens in daylight.

Night accidents reported by the 14 states totaled 136,244, according to the Bureau. This, the Bureau pointed out, is 38 per cent less than the 217,415 which were reported for daylight.

The Bureau's statement said that 2,895 fatal accidents were reported for darkness, pointing out that this figure is 40 per cent higher than the 2,065 fatal mishaps reported for daylight.

A tabulation accompanying the Bureau's statement shows that only 38 per cent of the 353,659 accidents occurred at night but that 58 per cent of the 4,960 accidents which were fatal occurred at night.

The chief cause of the higher fatality rate at night, the Bureau contends, is inadequate visibility due to insufficient light. It says the lack of enough light makes it impossible for drivers and pedestrians to see fatal dangers in time to save themselves.

City traffic is particularly dangerous at night as evidenced, the Bureau says, by the fact that two-thirds of urban fatal accidents occur after dark.

Evidence that poor visibility is the chief contributing factor in the high night fatality rate is seen, the Bureau says, in reports from cities which have relighted their streets. Reductions in night fatalities attributed to relighting, average 76 per cent, the Bureau disclosed. So, when you drive or walk at night, be much more alert and cautious than you are in daylight.

Transporting Hazardous Materials

RECOMMENDATIONS to prevent disasters such as the carbon disulfide fire in the Holland Tunnel between New York City and Jersey City on May 13, 1949, are contained in a detailed special report just issued by the National Board of Fire Underwriters.

The report says that the explosion and fire, caused by ignition of 48,530 pounds of highly flammable and volatile carbon disulfide in 80 fifty-five gallon drums on a trailer-truck in the tunnel serve to point out the "untold potential hazards which exist in the normal day-to-day highway transportation of dangerous materials."

Although nobody was killed in the fire, the National Board report states that it could easily have been a major disaster with loss of many lives, and it should provide a grave warning against flagrant violations of safety rules and lack of suitable provisions for enforcement of current regulations. "Fire services and safety groups recognize the special hazards that are being presented by these veritable 'warehouses on wheels.' They are therefore fully justified in demanding more stringent checkups and sterner measure," the report says.

Specific recommendations include:

1. A "safe routing" plan for the transportation of dangerous chemicals and explosives should be established for any area containing vehicular tunnels, bridges and congested highways.

2. Information about the nature of dangerous chemicals and explosive cargoes should be made available to the motor carrier by

the shipper.

3. This data should be transferred to each driver who accepts responsibility for the cargo.

4. Tunnel exhaust fans and ventilating systems need greater safeguards to protect them from fire damage.

5. Tunnels appear to need more fire-fighting equipment, particularly extinguishers suitable for varying types of fires. The possibility of adapting automatic sprinklers for tunnel protection should be studied.

6. Legislation governing transportation of dangerous chemicals and explosives should be standardized and penalties made more severe.

7. A cooperative program to educate shippers, trucking firms and drivers should be undertaken by the Interstate Commerce Commission, the American Trucking Association, and all state traffic and fire authorities to supplement the legislation and enforcement plans.

Emphasizing the nation-wide importance of the problem of preventing such fires, the report points out that there are approximately forty vehicular tunnels in the United States, and that there are more than 6,500,000 trucks and truck-trailers in use on American highways.

It quotes a warning by the National Fire Protection Association that "At times not only are life and property on our highways seriously exposed, but our homes, hospitals, theaters, commercial and manufacturing establishments, and sometimes schools and churches may be greatly endangered" by the movement of hazardous materials over streets and highways.

Serious violations of present safety regulations should be treated as felonies, it suggests, with heavier fines and stiffer prison terms.

Pointing out the "possible magnitude of the tragedy so narrowly and luckily averted," the report states that the chemical which caused the Holland Tunnel fire is one of the most dangerous in common use. Its vapors can be ignited by the heat of a light bulb or a steam pipe, and breathing high concentrations of the vapor may cause death. When the vapor burns, it produces gases which are also dangerous.

Value of Pre-Planning

"The fire was very difficult to extinguish due to copious fumes and close quarters," the report states. "Many hours were needed by the clean-up crews to remove the fused remains of the trucks. Hundreds of tons of rubble and debris were taken from the tube before it was opened to traffic, approximately two and one-half days after the incident." Sixty-six people were injured, and the inner wall surfaces and ceiling slabs of the tunnel were demolished for a distance of 600 feet by the tremendous heat that was generated.

"The effective manner in which this near-catastrophic incident was brought under quick control exemplifies the value of pre-planning and preparedness for emergencies, and argues for the necessity of establishing a complete disasters operations plan," the report states.

One factor cited as preventing heavy loss of life in the Holland Tunnel fire was the continued operation of the ventilating system, reducing the danger to the fire fighters and drivers of other trucks and cars.

Shortly after the fire, a spot-check was made of approximately 6000 trucks approaching the tunnel, the report states. More than 100 of them were turned back because of violations of safety regulations.

Modern Roads for Greater Safety

ATTAINMENT of the goal of only five auto fatalities per 100 million miles of travel, set at the recent President's Highway Safety Conference in the face of the 1948 record of 8.1 deaths "depends greatly on the desire of the public to bring the nation's war-deteriorated highways up to date."

This statement was made here recently by Charles M. Upham, engineer-director of the American Road Builders' Association, in an analysis of safety data which, he said, indicated highway fatalities are decreasing in proportion to the degree in which recommendations of the Conference have been applied in various states.

"This has been due to the remarkable work of the Action Program of the Conference, in which it was shown that had there been no such concerted effort, the highway death rate of the nation last year would have been 48,000 instead of 32,000," Mr. Upham said. "As General Philip B. Fleming, general chairman of the Conference pointed out, 'partial failures really reflect a failure to apply the Action Program and the program has not spread far enough into the grass roots.'"

Fewer Traffic Deaths

Citing records of the Automotive Safety Foundation, Mr. Upham pointed out that six states which diligently have followed the program lead in the decrease of traffic deaths in 1948. Rhode Island, he said, heads the list by a wide margin, with an exceptional record of 2.7 auto deaths per 100 million miles of travel, nearly one-third less than the goal of 6 set in 1946.

The other five states are Massachusetts, 3.8; North Dakota, 4; New Jersey, 4.2; Connecticut, 4.3 and New Hampshire, 5.

"On the other hand," Mr. Upham said, "New Mexico has a death rate of 12.1, approximately six times that of Rhode Island, or twice the amount of the set goal.

"The goal of 6 set by the Highway Safety Conference in 1946 has not been met, the average being 8.1."

Again referring to the 32,000 deaths in 1948 in comparison with the possible 48,000 except for the

efforts of the Action Program, Mr. Upham said:

"This record is even more remarkable than the figures indicate in the face of the deplorable condition of our highways. First the depression and then the war deterred the states and their subdivisions in their efforts to keep our highways abreast of the times. Inadequate funds, resulting in large measure from the postwar inflation, have compelled us to resort to makeshift and piecemeal procedures and are preventing us from executing the well-planned highway program we so obviously need.

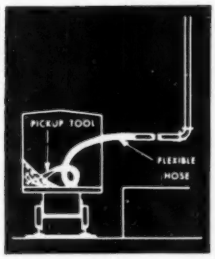
"In the interests of safety, national security, and the country's economy, we must adopt courageous, forward-looking policies which will not only bring our roads up to date and make them capable of handling today's increased traffic, but fit to accommodate the still greater traffic the future is certain to bring in keeping with our ever-expanding economy."

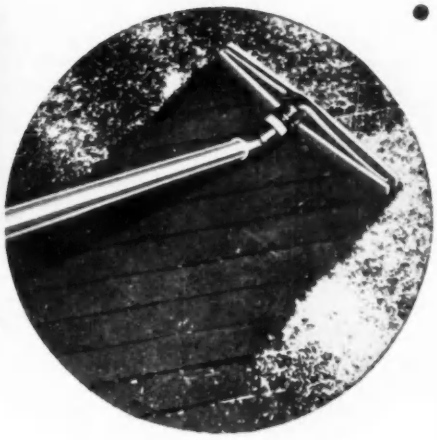
Naval Reserve Officers: Now Hear This

NAVAL Reserve officers who wish to keep posted on Navy Industrial Relations are invited to enroll in the newly activated Volunteer Industrial Relations Unit of the Third Naval District. Officers with naval or civilian experience in any phase of personnel administration, safety, training, or labor relations will find the proposed training program designed to familiarize them with current policies and procedures governing similar activities in naval shore establishments.

Meetings will be held twice each month, are non-pay status; but will earn credits under terms of the new reserve retirement law.

Complete details may be obtained by writing or phoning Commander Fred G. Lippert, USNR, c/o American Gas & Electric Company, 30 Church Street, New York 8, New York, Co. 7-5920.





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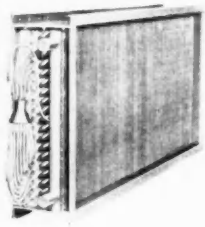

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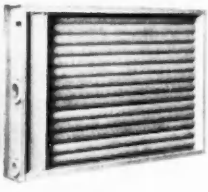

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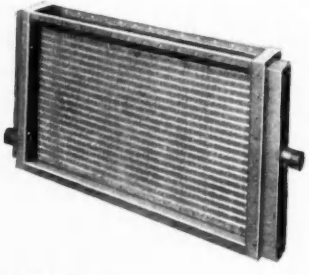

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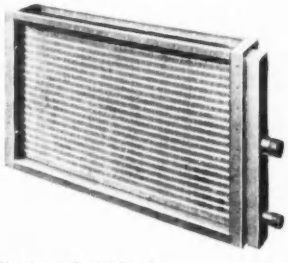

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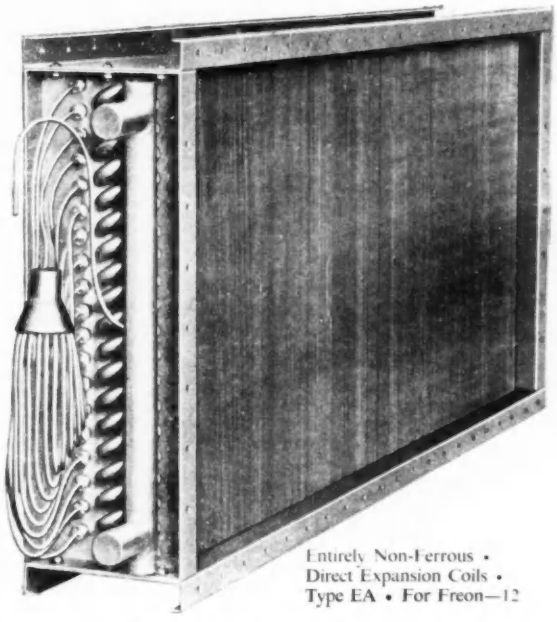

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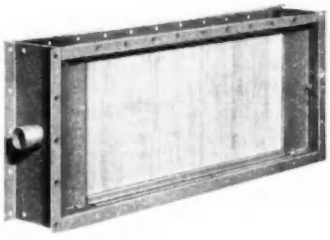
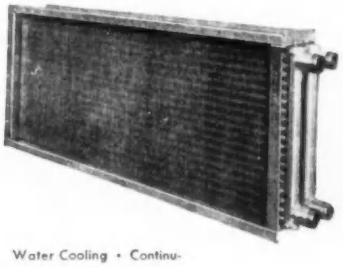


Zone Heating • Type HZA • For Steam



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Let's Bury "Safety" . . . . . In Our Hearts

By EVERETT W. MARTIN, Editor, Connecticut Journal of Industrial Safety

SEMANTICS is an interesting game, played with gusto by amateurs, and this writer is no exception. Words are born, grow in meaning and stature, are subject to almost human vicissitudes and sometimes die. Some words are like popular songs, quickly worn out by constant use.

The word "safety" for many people has an unfortunate connotation; is abstract, of course, and so to concrete minds is anathema. Let's bury the word, don't use it, forget it, for it doesn't exist! Substitute instead "accident prevention."

Why not at the same time discard a great number of other abstract terms such as "truth," "liberty," "freedom," "home." These words defy definition, exist only in the haze of relative values, and often as the toys of the intellectual.

Yet in the minds of many they do exist. As incentives and motivating forces they are as powerful as concrete words, and many times have almost unlimited potency.

Now "safety" is one of these abstract words, strong in its effects upon many individuals, picturing to their minds unhurt men and women pursuing the good things of life unencumbered and free from accidents.

Many individuals hold the opinion that "accident prevention is simply a production problem." This is not entirely true. In the observations of many industrial plants that have improved their injury records greatly it has been found that usually there is *one man* back of each improved record and in no case has that one man been motivated simply by "a production problem." He has been moved to action by a concern for human beings, in many cases for his friends. Safety to him was the well-being of people, not increased production. The latter was a desirable by-product, a sure corollary of his work.

Such enlightened men report that they have no objection to being called "safety men." They are proud to be engaged in the "safety movement." They have buried safety—in their hearts.

How to Protect the Hands and Feet

(From page 15) the following classification might be made:

Liquids—Rubber, synthetic rubber or plastic covering.

Solids not hot—Leather, canvas, or knitted glove.

Hot metal—Asbestos or a knitted glove that is commonly called a hot mill glove.

There are, of course, many types, weights, and grades of leather gloves. Some are reinforced with metal studs and some with other materials. So before deciding upon the use of reinforced gloves, it is well to study the job or operation carefully to determine just what is required to give the desired protection.

Foot Protection

If some of us take our hands for granted, it is even more true that we forget about our feet. Yet the lower extremities require just as much protection as other parts of the body, and in many occupations even more.

When thinking of foot protection the first thought is safety shoes. All shoes whether for dress or work should be stout enough to protect the feet of their wearers against tripping, slipping, and punctures.

The possibility of injury from slipping and tripping, falling objects, hot or corrosive substances, cuts or punctures, and extreme heat or cold is present in one or more combinations in many industrial occupations. Protection may be in the form of safety shoes, wooden shoes, sandals and boots with or

without special soles, or foot guards or metal toe caps.

All safety shoes have one thing in common, namely, reinforced toes. Such reinforcements are usually of a standard special steel construction to guard the toes from crushing, pinching, or cutting hazards.

Where there is a possibility of contact with energized electric apparatus, employees should wear protective footwear free from metal trimmings, and equipped with wooden pegged or sewn soles and heels. In operations where a spark created by friction might be hazardous, nails and trimmings should be of non-ferrous metals, such as copper or brass. The soles of such shoes are often made of rubber, or other non-conductive material.

Both overshoes and boots of synthetic rubber and natural rubber are available with steel toe protection. The shoe manufacturers are now building style and appearance into safety shoes and as a result are cutting down psychological resistance to their use.

There are many hazards to the feet where the regular safety shoe does not afford adequate protection from falling objects that strike the instep, or hot metals and caustic solutions.

Wooden-Sole Shoes

Where extreme heat is encountered, such as in steel mills, wooden-soled shoes or wooden sandals are often worn. Some shoes of this type are equipped with metal toe caps installed over the top of the ordinary toe cap as added protection.

In operations where heavy materials are being handled, such as in lipping steel, logs, and other heavy material, metal foot guards should be used. These guards, easily adjustable and removable, are made in a variety of designs and materials, and afford protection for the instep and ankle as well as the toes.

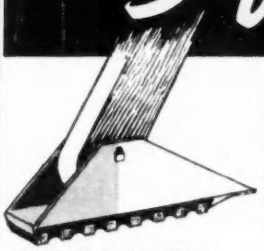
Because of women's desire for particular styles, safety shoes made for women have not been popular. Manufacturers are now attempting to correct this with improved styling. Women should be encouraged to wear work shoes of common sense styles with broad low heels and moderate soles for comfort and safety.

Protective equipment manufacturers have made all types of hand and foot protective clothing available to meet varied and specific needs. Industry, however, is still faced with the problem of how to make the employee wear protective equipment. Where the existing hazard is not obvious and a compulsory program is not in effect, frankly, it remains much of a problem. However, appealing to the vanity of women makes the use of hand protection a fairly easy task. Most women have a great deal of pride in the appearance of their hands. If the hand covering does not slow down the operation, is reasonably comfortable to wear, there should not be much difficulty in getting the employee—man or woman—to wear it. Improved styling of footwear should also do much to overcome employee resistance to what is, after all, for his own good—a fact he should be made to realize.

Abstracted from an address presented at the 25th Annual Midwest Safety Conference.

You Know You're SAFE When You Use

Safe-Hi PRODUCTS



SAFE-HI Ladder Shoes

. . . hold securely on any surface . . . wet, dry, soapy, oily or covered with snow or ice . . . **because** they give you this essential combination of Cord, Rubber and Ridges in the Tread . . . and a Self-sharpening Spike.

SAFE-HI Ladder Shoes

Approved by Underwriters' Laboratories.

Made in 2 widths, for straight ladders and stepladders. Stepladder model includes extra treads for brace legs. Holds all legs securely. Prevents "creep" or shaking user off balance; makes stepladder safe when folded and used against wall.

Non-Spark Ladder Shoes: Completely non-ferrous. Vital where sparks are a hazard. Made in both step and straight ladder models.

Spike Locks: Automatically lock shoes in spike position.

Pole Grips: Hold top of ladder securely on pole, pipe or corner.

Wall Grips: Hold top of ladder. Prevent side slip on smooth wall.

SAFE-HI Safety Belts

Engineered for maximum safety. Proved by new "Safti-graph" Test Method. Write for full information .

Window Cleaners' Belt, bolt type: Will stop maximum fall safely, with minimum shock load on building anchor.

Window Cleaners' Belt, stirrup type: For use on buildings not equipped with anchors or bolts.

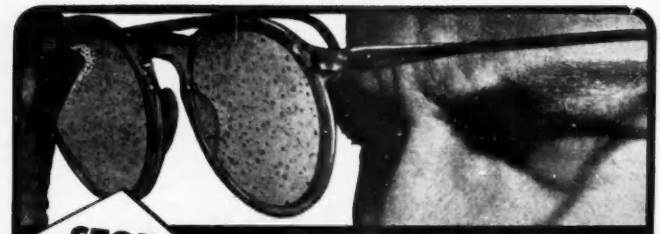
SAFE-HI Construction Belt: Fully meets U. S. Govt. specification 406-C. Hardware stands 5,000 lbs. without distortion. Friction buckle holds securely with only **one** insertion. Made with or without fixed shoulder harness, or with detachable shoulder harness.

SAFE-HI Shock Absorber for Safety Belts: Insures a gradual friction stop without jolt or rebound. Makes high work safe; falls harmless. Meets U. S. Govt. specification 419 fully.

Safe-Hi PRODUCTS

Ask your safety dealer or write us for descriptive literature.

Rose Manufacturing Co.
1731 Arapahoe St., Denver 2, Colo.



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Save your lenses with TUF-COTE, the only true lens protection against weld spatter and grinding wheel pitting. Convince yourself, just send for a free sample TUF-COTE treated lens – give it the works in your own shop, and you will insist on having us treat all the glass safety lenses of your spectacles, goggles and helmets with TUF-COTE.

We grind and treat prescription lenses too. TUF-COTE will leave them optically perfect, even clearer than before. For replacements order Wallace Eyeguard prescription glasses, TUF-COTE treated.

List of representatives sent on request.

WALLACE OPTICAL COMPANY • INC
12324 E. Jefferson Avenue, Detroit 14, Michigan

Gulf Coast Industrial Health Conference

NEED for a close understanding by industries of the importance of industrial health has been pointed up by the mass migration of industries to the Gulf Coast area during the past decade. At the same time, industrial wastes and stream pollution have been causing increasing concern in the region.

These important phases of the Gulf Coast's business picture will be the theme for the second annual Gulf Coast Regional Conference on Industrial Health on October 6 and 7 in Houston's Rice Hotel. A symposium, believed to be the first of its kind on the Gulf Coast, has been scheduled for the second day of the conference.

Primarily, the conference has been planned to benefit representatives of the medical profession, industrial nurses, safety engineers, public health departments, insurance companies and utility, sanitary and chemical engineers. Sponsors, however, point out that representatives of labor and management will mutually profit from the discussion of current industrial problems.

Joining the Houston Chamber in sponsoring the sessions are Texas Manufacturers Association, Texas State Health Department, Baylor University College of Medicine, industrial health section of the American Medical Association, Gulf Coast Chapter of the American Society of Engineers, Houston branch of the American Association of Industrial Nurses, and the Industrial Hygiene Foundation of America, Incorporated.

The Houston Chamber of Commerce is handling reservations.

How to Say It With Safetygrams

(From page 19) be impressed with economic loss and human suffering that lies behind accident statistics. Results are what count. I wish to assure you that management will be watching and fully backing your fine effort.

B. Use "SAFETYGRAMS" to congratulate and stimulate improved performance

1. Heartiest congratulations on your zero accident performance for May. Your campaign to drive safely walk safely get the safety habit is producing results. Please thank each employee who contributed to this splendid record and urge them to continue the excellent job.
2. We have just received final report on your safety campaign for second quarter which shows your safety committee has done outstanding job in reducing accidents by 20% over previous quarter. Congratulations and keep up the fine work.
3. As special award for safe driving without chargeable accident for five years am sending you today engraved gold watch. Congratulations.
4. Your departmental safety record for June reflects commendable improvement. With full teamwork job continuing feel certain you will top all previous performances for June.
5. You won Safety Merit Award for 1949. Congratulations to all!

C. Use "SAFETYGRAMS" to highlight upward accident trend

1. Your department shows upward accident trend from 3% to 7.5% for May. Essential immediate steps be taken to drive home critical need to score improved accident-free hours record for June. Please telegraph if you feel this can be done.
2. Plant two scored highest number of accident-free hours which leaves your plant in last place. Feel confident you can top their performance with intensified campaign for next quarter. Do

REDUCE YOUR DOCKBOARD WEIGHT 70%

MAGCOA One Man MAGNESIUM DOCKBOARDS

are easier... faster... safer handling

Use of magnesium, the world's lightest structural metal, makes it possible for one man to handle Magcoa Dockboards with ease. The lighter weight speeds up loading and unloading operations . . . cuts down danger of hernia and mashed feet or hands.

Engineered like a bridge to carry heavy loads, Magcoa Dockboards have a special "curb design" safety stringer* to prevent drive-off. Custom-built from basic standard design to fit the requirements of your particular docks.

Write for Estimate Data Sheet

NEW LIGHTWEIGHT MAGCOA HAND TRUCKS

With rigid, durable strength comparable to steel trucks of much greater weight. Built of tubular magnesium with rubber tired, ball-bearing cast magnesium wheels. Available in 3 sizes.

LIGHT STRONG MAGCOA BARREL SKIDS

Weighing as little as 25 lbs., yet with a capacity of 1,000 lbs. They're easy to handle . . . rugged in performance. Standard widths permit handling of 22 inch or larger diameter drums or barrels.

*Pat. Applied for

MAGNESIUM COMPANY OF AMERICA

One North La Salle Street, Chicago 2, Ill.

EASTERN DIVISION—30 Rockefeller Plaza, New York 20, N. Y.
WESTERN DIVISION—831 S. Flower Street, Los Angeles 14, Calif.

you think you can do it? Please wire.

3. Weekly report just received which shows upward accident trend your plant by 10% which points up urgent need for corrective action. Teamwork will do the job backed by interested, enthusiastic supervision. Good luck for September.
4. Increased accident ratio your department for May alarming. Suggest contest between plants with $50 cash award to each plant completing its quota without accidents with funds to go toward party, sick benefit, charity or shared among drivers.

D. Use "SAFETYGRAMS" to thank employees for safety suggestions

1. Thanks for your suggestion on kerosene storage as means of reducing fire and accident hazard. It is being adopted immediately. Please continue to send us other ideas.
2. Greatly appreciate your slogan "Safe Driving to You" which you suggested be used by all dealers to customers following sale our product. We are adopting it. Honorarium check for $10 being sent you today.
3. Your report on production time lost by supervisors and workers during accidents in plant three most constructive and helpful. We shall study and use the information you supplied. Thank you.
4. Your suggestion of issuing honor roll of safe drivers including special mention of those without accident in over 15 years is excellent idea. We are adopting it. Thank you for your interest. Please continue to let us have your ideas.

The suggestions above are just a few of the many uses to which "SAFETYGRAMS" can be put in promoting greater interest in safety on the part of your employees, and in helping to sharpen enthusiasm and accident-consciousness in the minds of everyone.

For any communication need related to safety and accident prevention, remember that. . . .

SAFETYGRAMS

- are effective!
- are read and re-read!
- stimulate the urge to act!
- drive home your safety message with a punch!
- surround your message with urgency and importance!
- leave a lasting, remembered impression!
- stir interest, quicken enthusiasm!
- attract and hold reader attention!
- reach the person to whom they are addressed!
- make readers extra accident-and-safety conscious!
- are warm, personal, impressive!

SAFETYGRAMS GET RESULTS!

Where a slip means a tumble—install . . .

FOOTHOLD®
SAFETY TREAD

Slippery stairs, aisles and ramps can make accident records go up like a skyrocket. Clamp down on these nasty spills and tumbles with quickly installed "sandpaper-surfaced" FOOTHOLD Safety Tread.

These inexpensive, heavy cloth-backed abrasive cleats or rolls can be quickly cemented to the existing floor surfaces and walked over right after installation. They're waterproof and resistant to oil, grease, alkalies and mild acids. Try a sample cleat — we'll be glad to install it at no cost to you. Write today for this demonstration.

BEHR-MANNING · TROY, N.Y.
NORTON abrasives

Oil Association Elects

THE Fire and Accident Prevention Department of the National Petroleum Association held its annual meeting at the Pure Oil Company Heath Refinery on Friday, June 24, 1949. The meeting featured a tour of the refinery, address by Mr. Tom A. Burke, Director Local Safety Programs, National Safety Council, Chicago, Illinois and an address on refinery metal inspection by Harry Bennett, Field Engineer, Universal Oil Products Corporation, Chicago, Illinois. New officers and Executive Committee were elected at the meeting as follows:

EXECUTIVE COMMITTEE:

C. K. Roof, Pure Oil Company Heath Refinery, Newark, Ohio, Chairman; Frank Sluze, Ashland Oil & Refining Company, Ashland, Kentucky; Russell Potts, Indiana Farm Bureau Association, Mt. Vernon, Indiana; J. H. Weiser, Quaker State Refining Company, Oil City, Pa.; Charles Ives, Sinclair Refining Company, Wellsville, N. Y.; Harry Elkins, National Petroleum Association, Washington, D. C., Counselor.

OFFICERS:

H. C. Salisbury, Kendall Refining Company, Bradford, Pa., President; Russell Potts, Indiana Farm Bureau Association, Mt. Vernon, Ind., 1st Vice President; F. A. Nicholson, Elk Refining Co., Falling Rock, W. Va., 2nd Vice President; W. E. Dunning, Freedom-Valvoline, Freedom, Pa., Treasurer; Theron Arras, National Refining Company, Findlay, Ohio, Secretary.

Retiring president was L. E. McArthur, Ashland Oil & Refining Co., Canton, Ohio.

This association sponsors five area groups who cover the states of New York, Pennsylvania, West Virginia, Kentucky, Ohio, Michigan, Indiana and Illinois. These groups visit each other's refineries periodically, conducting tours and discussing mutual fire and safety problems.

New Instruments Needed

(From page 21) temperature and flow detectors must function correctly in the presence of tremendous radiation, Mr. Cochran and Mr. Hansen pointed out. Continued exposure to radiation must not cause such physical deterioration of the device as to change its performance in a way that cannot be determined and compensated for. Also, devices to detect chemical contamination of the coolant must function in spite of the radioactivity of the coolant.

Detecting elements exposed to the coolant or blanket gas must be absolutely leak tight, they cautioned, for the escape of even minute quantities of radioactive coolant may cause a serious hazard. Similarly, if the blanket gas contains any gaseous fission products or radioactive dust particles, the leakage of gas may be very hazardous.

Long-lived Instruments Required

"Because of the extreme difficulty and expense of replacing faulty detecting elements, long operating life is much more important in these applications than is usually the case," they continued. "There is great incentive to develop long-lived devices, and there is frequent justification for using more expensive devices to insure long service. It is certainly to be hoped that instrument failures will not be the ultimate cause for shutting down the plant."

The atomic power plant now being built by the General Electric Company at the Knolls Atomic Power Laboratory is an experimental plant whose purpose is to investigate power production on a practical scale and breeding. (the simultaneous production of new nuclear fuel at a rate greater than the fuel consumption.)

They are FREE!
Turn to page 69
and see.

Fire Losses Decline

ESTIMATED monthly fire losses dropped to a new low for the year during July, totaling $49,592,000, or 4.2 per cent less than the June total, according to W. E. Mallalieu, general manager of the National Board of Fire Underwriters.

The July total represented a 2.7 per cent decrease from the estimated losses in July, 1948. This was the seventh month during which fire losses were lower than those reported for the same months a year ago.

Total losses for the first seven months this year reached $398,399,000, which is $39,036,000 or 8.9 per cent less than losses for the same period last year.

For the 12 month period ending July 31, 1949, losses amounted to an estimated $672,078,000. This is a decline of 5.5 per cent from losses of $711,437,000 for the 12 months ending July 31, 1948.

These reported losses under fire insurance policies include an allowance for uninsured and unreported losses.

Woodworking Guards

(From page 18) users obtain and follow instructions from the saw manufacturers for proper maintenance of all saws. Band-saw wheels should be kept clean and free from accumulations of sap, gum, or resins.

Saws should be inspected for cracks each time that the teeth are filed or set. Most cracks will start in the gullets of the saw teeth. If cracked saws are continued in service, the crack frequently grows larger and may eventually cause fragments of the saw to fly apart. If the saw is removed from service as soon as a crack is visible to the naked eye, the blade can usually be repaired either by welding the crack or by slotting the saw to remove the material on both sides of the crack and then making other slots to balance the blade. In either case the saw should be retensioned after the repairs are made. Unless a skilled sawsmith is employed, saws should be returned to the manufacturer for welding, slotting, or tensioning.

To prevent cracking:

(1) The saw should be tensioned for the speed at which it is to operate. If not, the saw will wobble and vibrate causing it to heat, expand, and crack.

(2) The teeth must have sufficient clearance (set or hollow grinding) to prevent burning. If the saw gets hot and expands, then cracking results.

(3) The saw should be in perfect round. In other words, the rim should be concentric with the eye.

(4) The saw must be in perfect balance or cracking will result.

(5) Saws must be kept sharp at all times; otherwise if the saw is not cutting, it will pound itself through the wood and thus cause heat and vibration, expansion and then cracking.

Drawings and text by courtesy of the American Standards Association.

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Clean as a Whistle...

by wearing COVER'S famous "nod & shake" gas-tight, fog-proof goggles. Keeps paint spray, gases, dusts, fumes, smoke out of your eyes—keeps your vision "clean as a whistle" indefinitely. You never have to remove goggles to wipe away fog that forms so fast on ordinary air-tight goggles. Just an easy nod or shake of the head does the trick.

COVER'S FOG-PROOF GOGGLES Sample Sent $1.65 pp.

DUPOR no. 24

U. S. B. of M. Approved Respirator. More than 24 sq. in. twin filters provide plenty of clean air regardless the dust hazard. Controlled breathing—panorama vision—no blind spots—makes it a favorite everywhere!

Sample Sent $2.50 pp.

For the best in eye protection get H. S. Cover's Gas-Tight, Fog-Proof Goggles...$1.65 pp.

H. S. COVER, SOUTH BEND, INDIANA

DON'T THROW THEM AWAY
BEFORE
AFTER
GLOVES COST YOU MONEY
WE CLEAN, STERILIZE, RE-SHAPE, SORT, PAIR AND PACK IN BUNDLES OF 10 PAIRS. WE FURNISH LOCK-TOP, STEEL CONTAINERS FOR COLLECTION AND SHIPPING
FREIGHT PAID WITHIN 300 MI.
USE THEM OVER AND OVER AGAIN
We are saving thousands and thousands of dollars a year for nationally known companies by reclaiming work gloves of all types; leather, cotton, asbestos, etc. IT COSTS NOTHING TO FIND OUT. TRIAL ORDER FREE!
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Why You Should Wear Sunglasses

SCIENTIFIC research has established that unprotected exposure of the eyes to bright summer sunlight reduces night driving visibility to a hazardous degree, Harry H. Lyman, Chairman, Standards Committee of The Sun Glass Institute, declared recently at the Institute's 11th Anniversary Meeting.

"We have learned, and the public should know, that there is a more compelling reason for wearing sun glasses than merely for comfort and protection against glare," Lyman said. "It's a matter of safety."

"Unshielded exposure to bright sun reduces the sensitivity of the eye to light with serious effects at twilight and at night," he said. "This was established in tests made during the war, since reported in medical literature, and which are only now beginning to become general knowledge.

"The dangers from unprotected exposure, discovered during the war tests, resulted in a complete change in attitude of the armed services toward sun glasses. A committee of the top vision scientists of the United States recommended enforced use of sun glasses in daytime by all military personnel in order to protect vision of troops at night. The same need to protect night vision applies to citizens.

"Tests have shown that ability to distinguish objects at dusk and at night can be reduced by as much as 50 to 90 per cent," Lyman said. "This night blindness means that the driver at night sees objects somewhat later than normal. The hazard is at its peak when sun bathers and vacationists are returning from a day at the beach, lake, or other summer activities in the bright sun." He said that wartime tests showed the effects on night visibility to be cumulative. Studies made for the Army and Navy showed that after one week of unprotected exposure to bright sun, it required two months to regain normal sensitivity to light at night.

"Since this is a serious public health problem, Medical Schools throughout the country are now conducting major research projects on the problems of sensitivity of the eye to sunlight," he said. "As an example, extensive tests are being conducted on Atlantic City lifeguards this summer."

A second important reason for wearing sun glasses, Lyman said, was for comfort—to prevent eye irritation and strain. He explained that because modern civilization uses indoor low-powered light, the eye finds it uncomfortable to adjust to sudden and violent changes in illumination. Thus, sun glasses prevent strain that comes from adjusting from indoor light to glare, particularly when the sun's rays are reflected off water, snow, masonry, city streets, etc.

At its two-day session, The Sun Glass Institute, which represents 90 per cent of the country's sun glass industry, reviewed commercial standards for high quality of lenses established by the Institute as a protection to the sun glass buyer. The standards program is administered by the National Bureau of Standards of the U. S. Department of Commerce.

Refinery Award

THREE top safety award flags, representing three successive six-month periods as the safest Sohio refinery, are in the possession of Latonia Refinery of the Sohio Petroleum Company at Latonia, Kentucky. The latest flag was awarded recently to the employees of the refinery at an award ceremony attended by more than 400 employees and their families and which was held at the Kentucky Theater in downtown Latonia.

Working for more than 580 consecutive days, employees of the Latonia Refinery have set a record of more than 800,000 manhours without a single industrial lost time accident. This record not only won

them the flag as the safest Sohio refinery, but, of course, set a record for the Manufacturing Department, since the period covered was not marred by any lost time accident at all.

In presenting the safety flag, E. B. McConnell, vice president in charge of Manufacturing for Sohio, said, "This remarkable record of safe working is a tribute to the high degree of cooperation and the spirit of employees and management working together at the refinery."

Using Color in Mines

USE of proper paint colors in coal mines to improve visibility and increase safety is recommended in a "Color Conditioning" survey prepared by the Du Pont Company for the mining industry. This company has a long association with the coal industry in its efforts to improve working conditions and increase safety in the mines. R. O. Bradley, a maintenance engineer in the Cleveland offices of the Finishes Division, has just finished a maintenance painting survey. It involves the extension of the system of the functional use of color which was developed for industry into the field of coal mining.

Many manufacturers have endorsed it as an aid in promoting efficiency, improving production and quality, reducing personal injuries, and improving employee-management relations. Its extension to other fields is based on its test in industry.

In the new 36-page manual on coal mines prepared by Mr. Bradley, recommendations are made for utilizing proven psychological and functional values of colors in certain underground areas to step up miners' morale and promote better seeing. In above-ground areas, specifications are outlined for the efficient use of color to promote good housekeeping and safety, as well as to keep maintenance painting costs low.

The manual covers shaft, slope, and drift mines; mine buildings and offices; homes, churches, stores and schools in mine communities. It also deals specifically with equipment of all sorts used in mines.

As an example of the way color can be applied to mines, here are some of the recommendations for an underground dispatcher's room:

The ceiling beams and upper walls should be of a sunlight semi-gloss enamel, to make them cheerful. The dado (lower wall) and sash and trim should be of a contrasting color that will not soil easily—either tan or medium blue. The cabinets, lockers, benches, and shelves should also be in tan or medium blue. The piping, to be less conspicuous, should be of the same color as the adjacent wall or ceiling area. These colors were chosen for their potential value as morale-builders for the miners.

For the lamp house, a white ceiling of flat wall paint or semi-gloss enamel is suggested. For the upper walls a light green was chosen, with a medium green for the dado, lamp racks, benches, counters, etc.

Asbestos Gloves for HOT Jobs

STEEL-GRIP 210-L

There's a *BIG* difference between asbestos gloves, and you can *tell* the difference when you get Steel-Grip 210-L asbestos gloves. The quality stands out — in the sturdy, close-woven asbestos cloth . . . Underwriters' grade . . . from the best mills in the United States. The quality stands out when you get 210-L *in* your hands and *on* your hands. Check the seamless, one-piece quality construction, no seams at the wrist or working edges to pull out or burn out on a hot job just when protection is needed most. The quality stands out also in the careful design and proportioning, in the big roomy cut, in the loose, airy comfort, in the fleece cotton lining that's anchored in each finger and thumb and won't pull out.

Thorough inspection at every step of manufacture doubly insures dependable protection, makes them veterans of rough, tough service. Get Steel-Grip 210-L and you will see what 38 years of experience and know-how mean in low-cost dependable protection. Standard 11, 14 and 23 inch lengths. Other lengths and many *special types* of asbestos gloves and mittens are available.

Write for Catalog. We are designers and manufacturers of a complete line of safety clothing. Tell us your requirements.

Industrial
GLOVES COMPANY

Main Factory: 1758 Garfield St., DANVILLE, ILLINOIS
(In Canada: SAFETY SUPPLY CO., Toronto)

Top Safety Award to American Optical Company

PRACTICING what it preaches, American Optical Company, a leader in the manufacture of safety equipment for industry as well as of ophthalmic and optical products, received on Aug. 3 the Distinguished Service to Safety Award of the National Safety Council at ceremonies held in Southbridge, Mass., and attended by Governor Paul A. Dever of Massachusetts.

The award, highest honor bestowed by the Council for excellence in industrial safety, was won by the company's New England plants for working almost 3,000,000 consecutive man-hours without a single disabling injury. These plants are located in Southbridge and East Boston, Mass.; Putnam, Conn., and Brattleboro, Vt.

James L. Tanham, chairman of the National Safety Council's board of directors and a vice-president of the Texas Company, who made the presentation, said in a message of congratulation to the 5,000 American Optical employees attending the ceremonies:

"Look for a moment at what you did in 1948: For every million man-hours worked, you had 1.1 accidents, 81 per cent better performance than similar industries; for every 1,000 man-hours worked, the lost time from accidents was only .03 of a day—91 per cent better than similar industries; for more than three months—from August 13 to November 22—you had a perfect record: not one lost-time accident. . . ."

The award was accepted on behalf of the concern by E. Weldon Schumacher, vice-president, and Jesse A. Blackburn, safety engineer, and represents the fifth safety prize won by American Optical Company during the past four years. In 1946, the concern won the Grand Trophy presented by the Associated Industries of Massachusetts and the Massachusetts Safety Council; in 1947 and 1948 it received the safety plaque of the Massachusetts Safety Council; also in 1948, it gained the first place trophy of the National Safety Council in a nation-wide contest between units of the metal industry.

James L. Tanham (right) presents the award to E. Weldon Schumacher, Vice-President of AO.

Principal speaker at the award ceremonies was Governor Dever. Introduced by Walter A. Stewart, American Optical Company's president, Governor Dever praised the safety achievement and said in part:

"What interests me particularly about this notable performance is the obvious concern for the welfare of human beings which alone could make such a record possible. I know that lost-time accidents are costly in terms of dollars to both the employee and the company. But I am sure that the kind of achievement we note today is made possible because of the recognition that the dollar cost of crippling accidents is far less important than the pain and suffering which they cause.

"In addition to the humane considerations to which I have referred, safety comes natural in Southbridge; after all, American Optical manufactures safety equipment for industry and spends a great deal of time, effort and money to preach the gospel of safety."

"It is perhaps appropriate," President Stewart said, "that a company which seeks to interest other employers in industrial safety products should conduct an efficient safety program in the interest of its own employees. Our program is of long standing. A measure of its effectiveness lies in the reduction of the company's accident fre-

quency rate from 5.3 to 1.1. Another measure lies in the recognition our program has received, all of which demonstrates that we practice what we preach."

Among those attending the ceremonies were: John T. Conley, Commissioner of Industrial Relations, representing Gov. Ernest W. Gibson, Vermont; John J. Egan, Commissioner of Labor and Factory Inspection, representing Gov. Chester A. Bowles, Connecticut; Wm. H. Wellen, Asst. Director, Massachusetts Department of Labor and Industries; Edgar F. Copell, president, Massachusetts Safety Council, and Roy F. Williams, executive vice-president, Associated Industries of Massachusetts.

Arc Welding

(Continued from page 31) enclosures, internal wiring and wiring details. The welding operator is exposed to the voltage on the output side of the machine, and every effort should be made by the manufacturer to foresee and eliminate any possibility of primary wiring coming in contact with secondary wiring under accidental conditions. Secondly, these details are important to safe maintenance operations.

Installation

Usually, in industrial practice, the primary or source of power wiring gets the most attention. In welding operations, the welding circuit—output side of the machine is equally important and this subject is therefore considered along with the general subject of installation.

The 1947 edition of the National Electrical Code for the first time covers the proper installation procedures for both direct current motor driven and transformer type a-c welders. These rules were carefully developed over a period of several years by the Committee responsible, in cooperation with Manufacturers and users, and constitute standardized practice as to size of primary conductors and circuit protection.

Provision must be made in all cases, either a-c or d-c machines, for grounding the frame or case of the welder, in order to protect the operator against the possibility of exposure to the power supply voltage due to possible breakdown of insulation in the machine. Although this is improbable in modern machines, this safety measure should always be observed.

Grounding of the frames is quite easy in machines permanently installed, but in portable machines, it can be easily overlooked. The use of multi-conductor primary cables is recommended. In the case of the small portable single-phase a-c welders, an Underwriters-approved primary cable with 2 power conductors and 1 ground conductor complete with primary fittings is usually supplied as a part of the machine. Attention is especially called to the practice which should always be followed in the installation of groups of single-phase transformer type welders on single-phase or poly-phase systems.

Usually the electrical engineer thinks first of balancing the load on a poly-phase system. Although most modern a-c welders have open circuit voltages within the maximum 80-volts recommended in the NEMA Standards, indiscriminate connecting of these welders without attention to polarity and phase relations of the individual welders can result in combinations of voltages which under possible, even if remote circumstances, could expose the operator to a considerably higher open circuit voltage. The American War Standard on Safety in Electric and Gas Welding and Cutting Operations contains explicit instructions on how to handle this problem.

To illustrate this point, consider two d-c welding generators, one set up for straight polarity work (holder negative) and the other set up for reverse polarity work (holder positive). The open circuit voltages in this case would be additive. Assuming the "work" ter-

Prevent **Falls**

"and slipped and fell when he stepped on the slick spot. His head struck a..."

Keep Production up...on its feet!

Falls top the list of personal injury causes, so **for safety's sake** keep your workers on their feet with TIGERFOOT, the no-slide, no-slip safety tread for shoes or boots. Designed by experts in the field of accident prevention, TIGERFOOT is ideal on slippery-wet, greasy or icy floors, ramps, platforms and scaffolds, on snow-glazed walks and yards. Instantly fitted over any footwear, with 3 sizes, (small, medium and large) they are easy to wear, comfortable to walk on and prevent accidents that are **costly, serious, painful.**

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Please send trial pair of TIGERFOOT (size) _____
Our slipping hazard is caused by _____
Firm _____
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Welding Goggle Leader

This No. 420 Welding Goggle is one of the most popular items in our entire line of Eye and Face Safeguards. Welders everywhere endorse these goggles with the exclusive patented features.

Moulded of rugged, black plastic—exceptionally light weight—cups are shallow, have rounded edges to assure snug fit — fresh air flows steadily through light-proof slots (see illustration) all around and back of lenses reducing fogging of lenses to a minimum —covered ball-chain bridge chain is adjustable to 1/1000 inch, assuring perfect fit for any face. Total weight less than 3 oz.

Write for folder featuring Welding Goggles

Most jobbers can supply these popular Sellstrom Welding Goggles. On request we will gladly mail you a special folder featuring a variety of welding goggles and lenses.

sellstrom safeguards

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Manufacturers of Face and Eye Protectors

656 N. Aberdeen Street, Chicago 22, Illinois

minals of these two welders to be grounded as in normal practice, a person coming in contact simultaneously with uninsulated parts of the electrode terminals, cables, or holders would complete the circuit and be subjected to the sum of the individual voltages of the two machines, say 160-volts in the case of machines having open-circuit voltages of 80-volts.

If a-c welders are not properly phased, similar freak conditions can exist and these can readily be avoided by following the methods of grouping the welders recommended in the Code referred to.

Installation of Welding Circuit

The welding circuit, consisting of welding service cable for the electrode lead and work lead, electrode holder, ground clamps and connectors for providing extensions to the leads are included under the subject of installation. These parts are all subject to hard usage and abuse, and, over a period of years, have been highly developed to meet both service and safety requirements.

Welding cables have been developed to meet requirements of flexibility and hard usage and cable of this type should always be used, and of a capacity to meet the maximum current requirements of the job. Standard tables are available in a number of places covering recommended cables size according to ampere capacity and length of leads.

When welding lead cable extensions are necessary, substantial insulated connectors of the locking type should be used.

The work lead (cable) is the most satisfactory means of providing the return circuit (ground) from the work to the welder. Some operating conditions may require using a steel structure or pipe line for the return circuit. Under such circumstances, precautions must be taken against creating unsafe conditions, such as bonding the joints and making sure that no conditions of electrolysis or fire hazard exists.

Pipes carrying gases, flammable liquids, or electrical conductors, should never be used for ground returns.

Pipes or structures used for ground returns should have all joints checked to make sure there is no sparking or heating that could constitute a fire hazard. Joints should be bonded if such structures are to be permanently used, and periodic inspections should be made to insure that no condition of electrolysis or fire hazard exists from using these structures as conductors.

Electrode holders of many individual design types are available for the whole range of welding work from the lightest to the heaviest classes. These holders broadly fall into two classes; holders which are fully insulated, and those which are insulated except for the electrode gripping jaws.

The insulated jaw holders were originally developed to protect the work from marring due to accidental contact or to provide some protection against accidentally leaving a bare holder in contact with the work, rather than to afford additional operator protection against shock.

Many bare jaw holders are still used but the trend is toward the fully insulated type. The fully insulated type should always be used with a-c welders, as, if properly made, it will afford additional operator protection. Care should be taken to make sure that fully insulated holders do not have exposed screw heads on any portion of the holder that might come in contact with the operator.

Where service conditions permit, a continuous length of cable should be used from the holder to the machine, thus avoiding joints which if not well insulated could come in contact with the operator. This is usually satisfactory if lengths do not exceed 35 feet and a good grade of extra flexible welding cable is used. In no case should cable splices be permitted within

ten feet of the holder.

It seems almost elemental to repeat that, in the case of portable welders, either large or small, care should be taken to see that primary supply cables are kept free of the welding leads. Also the welding leads on all welding machines, portable or stationary, should be kept in order and so placed as not to tangle with the operator, other people or other objects near the welding operations. Failure to observe these simple rules can and does lead to serious or even fatal accidents.

(To be continued in the October issue of SAFETY ENGINEERING)

From a paper presented at the 36th Annual National Safety Congress.
Pictures by courtesy of the Westinghouse Electric Corporation.

Movie Shows Air Power

A NEW 16 mm. black-and-white sound motion picture just released by The Bellows Co., Akron, Ohio, is a case history film showing the use of "controlled-air-power" in effecting cost reductions in various manufacturing processes.

The 28 minute film, titled "Production Miracles Though 'Controlled-Air-Power'" took over a year in the making. Camera crews shot many thousands of feet of film in plants all over the United States, ranging from plants employing only a few workers to plants employing many thousands.

Scenes shown are actual production scenes showing in detail how the application of Bellows "Controlled-Air-Power" devices to standard and custom built machine tools cut costs, increased production and reduced fatigue in such operations as milling, drilling, tapping, grinding, etc.

The film is available for showing, without cost, to plant executives in their own plant. Arrangements for showing the film can be made by writing Mr. W. C. Richards, Jr., The Bellows Co., Akron, Ohio, or by phoning any of their regional sales offices.

"Know-how" gained in serving industry nationwide enables Marsh & McLennan engineers to contribute much toward the conservation of human life, industrial health and property.

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Indianapolis Portland Superior Washington Cleveland Buffalo
Columbus Phoenix Vancouver Montreal Havana London

Crosley Plant Honored

EMPLOYEES of the Richmond refrigerator plant of the Crosley Division, Avco Manufacturing Corporation, were honored on Monday, June 27th, for completion of more than 1,000,000 man hours worked without a lost-time accident.

In a ceremony on company's grounds, Robert Duncan, works manager, told the 1,500 assembled employees that they had achieved, "a commendable safety record" and had "given millions of other employees throughout the nation a goal at which to shoot." Mr. Duncan attributed the safety record to four principal factors.

1. Personal interest and contact. Constantly impressing on supervisors and employees the importance of safety measures. Daily plant tours looking over equipment and employee operations, and personal contacts with supervisors and employees for closer safety observance.

2. Regular supervisory meetings are held, at which entire emphasis is placed on safety. Supervisory personnel are kept constantly aware of the importance of safety in their own operations.

3. New and modern safety devices have been installed as they have become useful throughout the plant.

4. Safety equipment is given a thorough inspection regularly.

Kimball Safety Products Co. In New Quarters

KIMBALL Safety Products Company, manufacturers of Eye Protection, Hand Protection and Body Protection safety items, have moved to new and larger quarters at 9310 Wade Park Avenue, Cleveland 3, Ohio. The new quarters have a separate department for precision grinding of lenses for the famous Kimball line of goggles and other eye protection devices. Improved production facilities in this new plant assure a better quality of product and improved delivery service to the trade.

Before you invest

check these advantages of

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VACUUM CLEANING SYSTEMS

✓ *Built for heavy duty*

For your safety campaign against dust hazards, Hoffman vacuum cleaning equipment is built for continuous heavy duty service. Sturdy construction and efficient design assure fast, thorough cleaning at low cost.

✓ *Larger dust capacity*

Higher vacuum and greater dust capacity in Hoffman equipment. You can do more cleaning for longer periods. Exclusive features for disposal of collected dust speed up cleaning operations.

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With normal lubrication, hundreds of plants have established amazing maintenance-free records with Hoffman equipment. No internal mechanical wearing parts in the Hoffman exhauster. Bearing design is outboard mounted for quick, easy change.

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Get proof! Names of plants in *your* industry who solved dust problems with Hoffman portable or stationary equipment, by writing now.

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Leading Speakers Announced For National Safety Congress

TALKS by important business leaders in some of America's largest companies will highlight the program of this year's National Safety Congress and Exposition, to be held in Chicago, October 24–28.

Nearly 12,000 safety-minded persons from all corners of the United States and from Canada and other parts of the world will meet in Chicago for five jam-packed days at the 37th annual convention of the National Safety Council.

They will hear such outstanding businessmen as Gustav Metzman, president of the New York Central System; James Tanham, vice president for industrial and public relations of the Texas Co. and chairman of the board of directors of the National Safety Council; James E. Trainer, vice president of Firestone Tire and Rubber Co., and Earl E. Moore, vice president for industrial relations of Carnegie-Illinois Steel Corp.

The Congress also will be addressed by such nationally known figures as Dr. Andrew C. Ivy, vice president of the University of Illinois medical schools, who will discuss alcoholism in industry, and Maj. Gen. Philip B. Fleming, chairman of the U. S. Maritime Commission, who will talk on maintaining safety on the high seas.

Labor-Management Meeting

A feature of the Congress will be a labor-management safety symposium on what can be done by labor organizations and industry to reduce off-the-job accidents. Labor's viewpoints will be presented by James L. McDevitt, president of the Pennsylvania Federation of Labor, A. F. of L., and Harry Read, executive assistant to the secretary-treasurer, Congress of Industrial Organizations.

At the early morning classes, B. D. Danchik, Chicago management consultant, will lecture on the "Strategy of Plain Talk"—how to make a speech.

There will be more than 200 Congress sessions on all phases of safety, and more than 500 program participants will take part in the discussions.

A display of radiological protective equipment by the Oak Ridge National Laboratory of the U. S. Atomic Energy Commission will be part of the industrial exposition in the Stevens hotel.

Sessions on industrial safety will be held at the Stevens, Congress and Morrison hotels. Commercial vehicle activities will be centered in the Palmer House. The Morrison hotel will house the school and college, farm and home sessions. Traffic meetings will be held in the Sherman hotel, where the public safety exposition also will be located. The women's activities luncheon will be held in the La Salle hotel.

A New Name For an Old Company

BECAUSE of expansion of business interests and a constantly increasing variety of products, the manufacturing firm, well known for 38 years as THE TAMMS SILICA COMPANY has incorporated under the new name of TAMMS INDUSTRIES, INC. The management and board of directors felt that this name better signifies the wider range of manufacturing activities in which the company is engaged today. General offices will remain at 228 North LaSalle Street, Chicago.

Reviews of Important Free Bulletins & Catalogs Will Be Found On Page 69 of This Issue

Value of Eye Programs

"EYE injuries spare nobody in industrial occupations," says A. G. Bungenstock, director of safety at the Kearny, N. J., plant of Western Electric Company.

In an article in the summer issue of the SIGHT-SAVING REVIEW, published by the National Society for the Prevention of Blindness, Mr. Bungenstock reports on a recent survey made in one of the Western Electric plants. Over a period of 22 years eye injuries occurred to employees in 96 different occupations ranging from bench hands, who suffered the greatest number, through screw machine operators, platers and dippers, welders and wiremen, as well as some clerical workers. Even the supervisors were not spared, for the survey reveals that they sustained four per cent of the eye injuries.

"The outstanding single cause of these injuries was failure to wear safety glasses, though they were provided," states Mr. Bungenstock. "If you have lost even one eye in your plant, that is enough indication that an adequate eye protection program must be installed."

The job of selling management on such a program need not be too difficult, he advises. By comparing the high cost of the many factors involved in eye injuries and the moderate expenditure necessary for a prevention program the safety engineer will have little trouble convincing management that "it is smart to spend money to save money as well as eyes."

Company Program

Western Electric Company figures for a two-year period offer valuable evidence. In that time at the Kearny plant about 3,700 pairs of prescription glasses and about 18,000 pairs of planos were issued. During the same period the lenses in 24 pairs of safety glasses were shattered. Mr. Bungenstock believes that every one of these lenses undoubtedly saved an eye.

"As a matter of fact," he states, "there must have been many more cases in which the impact of the flying body might have been enough to blind an unprotected eye but was not enough to crack the safety lens, and these would not be brought to me. At least 24 eyes were saved in two years. The normal compensation rate and all the attendant expense for the loss of an eye runs to about $3,000. At that rate, 24 eyes would have cost us $72,000. We spent $58,000. Purely from a profit-and-loss standpoint we saved $14,000. But a more important consideration is that these 24 employees still have unimpaired vision. Their earning power has been preserved for the rest of their lives; they have been saved the intense mental and physical suffering attendant on the loss of an eye. It is no exaggeration to say that a good eye protection program will pay dividends beyond measure."

Fleming to Address Labor Officials

GLENN G. FLEMING, Safety Engineer, Celanese Corporation of America, will address the convention of the INTERNATIONAL ASSOCIATION OF GOVERNMENTAL LABOR OFFICIALS on the subject of Industrial Safety. The convention will be held at New Orleans, La., September 27th to 29th.

The International Association of Governmental Labor Officials is an organization composed of the Commissioners of Labor in the United States, Ministers of Labor in the provinces of Canada, Nova Scotia, and Puerto Rico. Hon. Charles Sattler, Commissioner of Labor of the State of West Virginia is President of the Association.

One important subject which is included in the agenda of all conventions of the Association is the subject of industrial accident prevention by the co-operative efforts of State Governments, Management, and Labor, and outstanding men in the field of Safety are invited to speak.

CAN ASPHYXIA STRIKE WORKERS IN YOUR PLANT?

Crushing accidents . . . severe electrical shock . . . heart attacks . . . heat suffocation . . . monoxide poisoning . . . smoke suffocation . . . drowning . . . and other forms of asphyxia can strike down workers in your plant no matter what you make. Industrial experience has shown that accidents involving asphyxiation can occur despite the most carefully laid safety precautions. And when a worker stops breathing, time and death will not wait for haphazard rescue efforts.

SAVE WORKERS LIVES COMBAT DISABILITY with an E & J RESUSCITATOR

YOU HAVE A RESPONSIBILITY to protect your workers from asphyxial hazards, to prevent loss of man-hours, and to minimize company liability for death or injury.

YOUR BEST PROTECTION when asphyxia strikes is the automatic resuscitation action of an E & J Resuscitator. This life-saving instrument breathes for those who are unable to breathe for themselves. Through a face mask it introduces oxygen into the victim's lungs and exhales for him. Because it automatically adjusts itself to lung capacity, the E & J Resuscitator is as safe for a baby as it is for your strongest worker. It is light and durable . . . one person can carry . . . operates on its own oxygen power . . . is easy to use. See for yourself why this safe, efficient instrument is considered essential equipment by industries, rescue squads and hospitals the country over. Send coupon below or write for a demonstration. There is no obligation to buy but you owe it to your company to see the resuscitator in action.

E&J *The Breath of Life* ...RESUSCITATOR-ASPIRATOR-INHALATOR

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GLENDALE 1, CALIFORNIA

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☐ Please arrange an E & J demonstration.
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name _____
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Dockson's No. 1250 Turretype Arc Welding Helmet shown here.

Dockson WELDING & SAFETY EQUIPMENT

You get service-plus from DOCKSON "Better Built" Welding and Safety Equipment. Selected materials, experienced engineering and practical construction give you the BEST PERFORMANCE and MODERATE COST.

There is a DOCKSON distributor near you. Name on request.

Write for catalog of complete Welding and Safety line.

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Fire Prevention Week, October 9–15

PREPARATIONS for Fire Prevention Week began early this year with President Truman's issuance during the first week of August of a proclamation fixing observance for the period October 9 to 15.

The Chamber of Commerce of the United States and its sponsored Waste Council, will direct the campaign through some 2,600 local chambers and 1,300 fire prevention committees.

Cooperation Needed

In his proclamation, the President directed attention to the fact that effective fire prevention is not accomplished by a one-week campaign but must be carried on throughout the year. He said:

"I earnestly request that during that week all of us undertake a year-round campaign against destructive fires in our homes and in our communities."

The President also requested local governments, the Chamber of Commerce of the United States, the National Fire Waste Council and other public-minded organizations to cooperate fully in the observance. He likewise directed appropriate agencies of the government to assist.

Copies of the Presidential Proclamation are being sent to all local chambers of commerce by A. L. Kirkpatrick, manager of the Chamber's Insurance Department and secretary of the National Fire Waste Council, together with a letter urging that they conduct vigorous campaigns in their communities and particularly in the schools. A list of posters, bulletins, motion pictures and other publicity is likewise being distributed to chambers of commerce affiliated with the National Chamber.

Torit Company Expands

THE Torit Manufacturing Company is adding a sheet steel fabricating department to its main plant in St. Paul, Minn. Work is nearly finished in the consolidation and rearrangement of the other departments to make room for this new manufacturing division, and the installation of brakes, shears and other equipment was completed in mid-July.

To gain additional room for these expanded operations, Torit also is constructing an addition to the plant for the storage of oxygen and acetylene cylinders handled by Torit's welding equipment and supply division, St. Paul Welding and Manufacturing Company.

When these changes are completed Torit will be doing its own fabrication of the cabinets for its dust collecting equipment. These were formerly made to Torit specifications by another St. Paul firm. It is expected that these changes will speed up production and improve deliveries of these machines.

In addition to dust collecting equipment for grinders, polishing machines, etc., used in industrial plants throughout the country, Torit manufactures dental supplies and equipment. The new department will facilitate fabrication of certain of their dental items as well. A branch of the main plant is located at 204 West 4th St., St. Paul, where filters for the dust collectors are made, along with a number of cloth specialties.

Situation Wanted

Situation wanted by young man experienced as marine and stationary engineer; five years licensed teaching experience. Well versed in personnel, safety, job management as head of corporation and director of private trade school. Desires position in industry where natural aptitude and enthusiasm of youth can go places. Box 34, c o Safety Engineering, 75 Fulton St., New York 7, N. Y.

Safety Course at CCNY

THE responsibility of management for the prevention or control of industrial accidents and diseases will be the subject of a new course in "Industrial Safety and Hygiene" to be offered during the 1949 Fall Term by the Evening and Extension Division, City College School of Business, New York.

Classroom discussions and lectures will all be designed to provide the students with an understanding of the problems of industrial safety and hygiene, and to help them develop the ability to discharge the associated duties, such as equipment design, maintenance, and promotion of safety rules.

James M. Brown, Assistant Engineer for the Consolidated Edison Company, will be the instructor for the course.

The class will meet each Tuesday evening from 6:50 to 8:30 P.M. starting September 27 and continuing for fifteen weeks. Total fees include $14 course fee, $2 registration fee, $1 library fee, and 50c student activity fee.

Students may register for this course in the Auditorium of the City College School of Business, 17 Lexington Avenue, New York, from 6:00 to 8:30 P.M. on September 15 and 16, from 11:00 A.M. to 1:30 P.M. on September 17, and from 6:00 to 8:30 P.M. on September 19.

Wheeler Wire Co. Makes Appointments

GEORGE B. HORN, Vice President of The Wheeler Insulated Wire Company of Waterbury, Conn., has announced the appointment of Marshall J. Murphy as General Superintendent of all departments. Mr. Murphy has been employed by Wheeler since 1929 as departmental superintendent. He was previously employed by The Acme Wire Company of New Haven, Connecticut and by The Easton Coil Company of Easton, Pennsylvania.

I KNOW I'M SAFE... with WOODEN SOLES!

Reece Orthopedic Shoe for BROKEN FOOT BONES CRUSHED TOES SWOLLEN FEET

No. 175—MEN'S
No. 173—WOMEN'S

No. X175-CG
No. X173-CG

WOOD SOLE ACTS AS SPLINT—HASTENS HEALING

Corrugated metal footguard is optional. High enough to permit heavy bandaging. Gives maximum protection against further injury while working.

KEEPS ME ON MY FEET ON THE JOB.

There is no substitute for Reece Wooden soles

REECE WOODEN SOLE SHOE CO.

DEPT. SE-6 COLUMBUS, NEBRASKA

Vacuum Cleaning

(From page 24) method definite economies were being effected in other directions, such as labor-saving because more thorough and complete cleaning was accomplished and the necessity of repeating cleaning operations after hand methods was gradually reduced; elimination or reductions in defects in products which was of direct benefit in production operation; salvage of material, and improved efficiency of the employees because of having a cleaner plant.

After their original experience with heavy duty vacuum cleaning equipment many companies have systematically put this equipment in all of their plants. Such action on the part of so many industrial companies is indicative of the economies and beneficial results that can be accomplished with a properly engineered installation to take care of the many requirements that may be involved.

Pictures by courtesy of U. S. Hoffman Machinery Corporation.

PRODUCTION GOES UP! COSTS GO DOWN!

when you protect your workers with OLYMPIC GLOVES

This welder's gauntlet (#5543S) features Olympic's famous one-piece back construction. Chrome split leather especially tanned for heat resistance . . . shrinkage-proof . . . inside back of hand and back of fingers lined with heat-insulating wool fabric . . . thumb seam reinforced with leather welt. For men and women. Remember Olympic has a glove to fit every job!

FREE Send for Illustrated Catalog of Safety Work Gloves, Finger Protectors and Safety Apparel.

OLYMPIC GLOVE COMPANY Inc.
95 Madison Ave., Dept. 19, New York 16, N. Y.

THE Future SHOWS

Cleveland, Ohio

Eleventh Annual Ohio State Safety Conference and Exhibit, Sept. 20–22. (Carter Hotel). Carl L. Smith, secretary-treasurer, 2073 East 9th St., Cleveland 15, Ohio.

Houston, Texas

Second Annual Gulf Coast Regional Conference on Industrial Health, October 6–7. (Rice Hotel). Leonard S. Patillo, publicity director, Chamber of Commerce, Houston, Texas.

Chicago, Ill.

Thirty-seventh Annual National Safety Congress and Exposition, (Stevens Hotel), Oct. 24–28. R. L. Forney, General Secretary, National Safety Council, 20 N. Wacker Dr., Chicago 6, Ill.

New York, N. Y.

Seventy-seventh Annual Meeting American Public Health Association, October 24–28. (Hotels Statler and New Yorker). Dr. Reginald M. Atwater, executive secretary, 1790 Broadway, New York 19, N. Y.

Shreveport, La.

Ark-La-Tex Annual Industrial Safety Conference, Nov. 3, Charles E. Doerler, managing director, P.O. Box 806, Shreveport, La.

Cleveland, Ohio

First Plant Maintenance Show and Conference, Jan. 16–19. (Auditorium). Clapp & Poliak, Inc., exposition management, 341 Madison Ave., New York 17, N. Y.

Miami Beach, Fla.

National Society for the Prevention of Blindness Conference, March 26–30. (Floridian Hotel). National Society for the Prevention of Blindness, 1790 Broadway, New York 19, N. Y.

SEE Technicolor Films of INDUSTRIAL SAFETY EQUIPMENT

IMPORTANT ANNOUNCEMENT

To Delegates Attending the National Safety Congress at the Stevens Hotel, October 24th Through to October 28th.

Advance reservations for special groups can be taken on for Safety Information tours via a most complete showing of technicolor films through many of the foremost Plants in the U. S. A. at Safety Center,
542 So. Dearborn St., Corner Harrison, Chicago 5, Illinois

Only 5 minute walk from Stevens Hotel for evenings of October 24th to 28th. Instructive and informative technicolor films for Industrial and Insurance Company Engineers. Make reservations immediately.

General sessions at Safety Center, 2:00 P.M. to 8:30 P.M. each day during Convention Hours, other days 8:30 A.M. to 5:00 P.M.

Major C. B. Cannon, Manager

How To Prevent Injuries

(From page 27) the responsibility of management, and, aside from the 2% of injuries due to "acts of God," 98% of all injuries have been conceded to be preventable.

So very many services and devices are available to management and safety men, that there is no longer a valid alibi for neglecting to utilize known safety measures.

If the job of safety man has just been assigned to you, don't worry about your not knowing all the answers! The longer you are on safety work the more you will realize how much more there is to know. Sources of information and advice are so plentiful in the safety profession, that you need never be at a loss for specific knowledge on how to meet safety problems.

Here are some of the sources of Safety knowledge:

Safety courses in schools and colleges

Safety Councils—local and national

American Society of Safety Engineers (ASSE) local chapters

Safety Periodicals and Books

Advertisers and their salesmen

Government and State Labor Dept. reports and services

Insurance company publications and services

Consulting services

Perhaps the soundest suggestion that can be given the Safety novice is not to try to carry the entire safety load oneself. Rely on department heads and supervisors who know all there is to know about their own divisions. It doesn't pay to antagonize them by trying to assume responsibility—even for safety—that is rightfully theirs. No safety man can be all over the plant at one time. He must be able to depend on others throughout the plant to be alert to hazards and let him know when his help is needed to get things done that will prevent accidents.

Getting Things Done

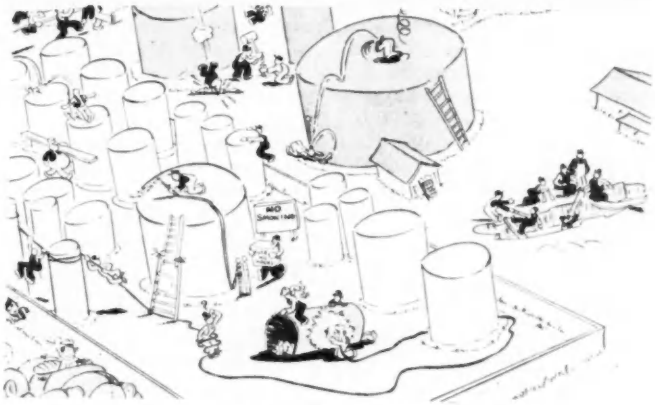
Resourcefulness is as important

as enthusiasm to the man who has the job of maintaining safe operation. Not long ago a safety director found himself in a new job that would have been a challenge to anyone genuinely interested in injury prevention. One problem was a shop in which the machines were woefully unguarded. An inspection revealed that at least $10,000 would be needed. Management refused to appropriate the money and insisted that each machine guard would have to be considered on its own merit. A careful study of the company procedure disclosed that the safety director had authority to order anything up to $50, and that the chief engineer could authorize expenditures up to $250. You may be sure the two men became close friends! The result was a total investment of over $12,000 that first year and a reduction in injuries that amply justified the outlay. Incidentally there was a psychological advantage in taking on the guarding jobs one at a time. In this way the operators were made aware of management's interest in their safety.

A large firm in the food industry had been drifting along without any safety direction other than that of the insurance representative. The V. P. in charge of production was disturbed at the amount of time consumed in so-called safety meetings. An experienced safety director was appointed. The new man made no attempt to change things right away, because there were too many old-timers involved. Instead, he sat through meetings in each plant—each lasting over two hours with as many as forty key men present—and listened to the drone of injury reports being read. The reports were at least two months old and the men from the departments concerned—if they were awake—had forgotten most of the incidents.

During the second month the committee set up was completely reorganized. One man from top supervision was appointed to the safety committee by the department heads of each of ten divisions. The

SAFETY ENGINEERING Salutes a Safety Idea for September



A small section of the cartoon for the Portland Gas & Coke Company's accident contest.

MOST safety contests offer prizes for the fewest accidents, but Portland Gas & Coke Company in Portland, Oregon, is offering prizes for the most accidents and near-accidents!

But the accidents and near-accidents are on paper only and it's all in fun in spite of a serious purpose. The whole thing is an unique contest in which contestants examine closely each of more than 200 cartoon characters on an exaggerated drawing of the Company's gas manufacturing plant.

Animation is the keynote, with most of the characters going about their various activities in a manner that would make a safety engineer tear his hair and an accident insurance man go out of business!

The exception in the case of the safety engineers is Gasco's own safety engineer, George Lewis, whose idea the whole thing was. Facing the fact that doing a job safely doesn't bring the fanfare of screaming sirens and headlines on page one, Lewis decided that perhaps the best way to bring safe working practices to the attention of workmen would be to exaggerate *un*safe working practices.

This was accomplished in a big way by Gasco's own talented cartoonist, Bob Lem, who combined a rare sense of humor with more than a year's experience working at the Plant, to come up with what might be called a safety engineer's nightmare.

His cartoon characters are literally swarming over the Plant, the poses ranging from being caught in the blast from a gas generator stack to sawing off a high plank with men on the end of it. Such "trifles" as welding near a tank of benzol and straining at a 300-pound weight are scarcely worthy of mention!

At first it was intended to open the contest only to Plant personnel, but as word spread and interest seemed to know no bounds, it was decided that much would be gained by including all members of the organization. This was done with the exception of members of the Personnel Department and a few others in on the know.

Reproductions of the cartoon, measuring 13 x 18 inches, were mailed, along with contest rules, to all home addresses, and soon wives, kiddies and other members of the family joined in the fascinating game of adding to the list of unsafe things that go on in the cartoon.

First prize of $50 is to go to the person finding not only the most workmen engaged in unsafe practices, but also naming the unsafe practice that is being committed the greatest number of times. Other prizes consist of one for $25 and five each for $5.

insurance man and the safety director completed a committee of twelve. One week before the Safety Committee meeting each member received a statistical analysis of all injuries, grouped by departments. With the analysis they received a notice of the meeting and a detailed agenda accounting for every minute of the hour allotted. Incidentally the paper work was caught up to the point that accident reports were recorded up to within a few days of the meeting. In order to maintain the interest of former committee members they (as well as executives and supervision) received a copy of the minutes of the meeting along with the injury summary.

Basic Program

1. Organize flow of information to supply data required for records.

2. Have Heads of Departments (who can be made to realize they are responsible for the safety of everyone in their dept.) appoint a qualified safety representative for the department to act as contact man for the safety director and serve on the Executive Safety Committee.

3. Set a regular date for Safety Committee Meetings—a date that does not conflict with other regular meetings the contact men must attend.

4. One week before the meeting send a notice with agendas, and attach injury summary grouped by departments showing direct cost figures. (See the typical Safety Committee Meeting Notice)

5. Hold meeting, adhering closely to time schedule.

6. As soon after meeting as possible send minutes of the meeting not only to committee members, but to all top executives and supervisory personnel—and the medical dept.

When this part of the Safety Program is smoothly organized, other activities are easier to inaugurate and control. Psychologically the biggest factor in maintaining safe operation is a deep seated awareness of safety on the part of every employee. Sloppy habits and general indifference are easily recognizable evidence of a bad safety attitude.

The remedy for an unsound attitude begins with the assumption of a correct attitude on the part of management. After all, management's attitude is invariably reflected in the attitude of employees.

For Safety
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Red Boot for Hunters

IT'S going to be easier this fall for hunters to avoid shooting each other.

A new bright red over-the-shoe rubber boot has been introduced by Hood Rubber Company, to increase the safety factor when the nation's sportsmen start prowling the woods for deer, rabbits and other wild game.

Wool pile fleece-lined, and with an inside shearling cuff at the top, the 12-inch red boot stands out in sharp contrast to fall foliage and is especially visible against a background of snow.

Get Back Into the Groove With a New Safety Product
See Pages 70-71

Why a Safety Program?

(From page 13)

even in the case of anthracite mining steel erection has a higher severity rate.

The average frequency rate for all industries is 12.95 and severity 1.27. The frequency rate for steel erection is 59.95, or almost 500% worse, and the severity rate is 12.59, or almost 1,000% worse than the average. General building construction has a frequency rate of 31.99 and the severity rate 2.09, so that it is 250% worse than the average of all industries in frequency and twice as bad in severity.

In 1947 the construction industry was 34th out of 40 in severity rating. Approximately 150,000 men were disabled, 2,400 of these workers died, and about 4,600 were left some form of permanent physical impairment, such as the loss, or permanent loss of use, of some part or function of the body. This means that one out of 16 suffered an injury and three out of every 1,000 were either killed or suffered permanent disability.

Let me quote from the March, 1948 issue of "Construction," a publication of the United States Department of Labor, Bureau of Labor Statistics:

"The humanitarian and social implications presented by this large volume of injuries are immeasurable. From the economic viewpoint alone, however, it is clear that these injuries constitute a very large expense item which must be absorbed by the industry. The actual time lost by construction workers in 1947 because of work injuries experienced in that year is estimated as about 3,300,000 man-days. On the basis of current average hourly earnings for construction workers, this would represent a direct loss of $46,200,000 in wages alone.

"The time lost in 1947, however, does not adequately measure the

real loss resulting from these injuries. Many of the seriously injured workers will find that their earning ability will be reduced for the remainder of their lives, and for those who were killed the loss is equivalent to their entire expected earnings during the years to come when they would have been working if their careers had not been cut short by premature death. If additional allowance is made for the future effects of the deaths and permanent impairments included in the total, the economic time loss chargeable to the injuries experienced in 1947 would amount to about 24,100,000 man-days. At current earning levels this would represent a loss of $337,000,000 in present and future earnings, all of which must be absorbed by the employers, the workers, their dependents, and the consumers.

"Historically, the construction industry has consistently had a high injury record."

What Can Be Done About It?

Evidently a great deal, if we would do it. Again according to "Accident Facts"—the best no-injury record in the construction field was a job of the Dupont Company at Belle, West Virginia, with 3,582,134 man hours worked without a disabling injury, and we find this same company holds the record in the textile industry with 18,871,795, the chemical industry with 16,109,608, and iron and steel products at the Remington Arms plant with 10,165,400. Evidently Dupont knows how to prevent accidents in any field. The answer is simple. They have a safety program. They find it pays, they practice safety, and they make the contractor practice it.

In the majority of cases, the large jobs have a better safety record than the smaller ones, for the simple reason that there are safety engineers watching these larger jobs. Again it is a matter of cost. If the contractor didn't have safety engineers on the job, you may be sure the insurance companies would, to protect their interests and lower their costs.

One general contractor with jobs in 14 locations shows 423,800 man hours worked, with one lost time accident, 10% of the frequency of the national average. We notice also a job well done by the Constructors Association of Western Pennsylvania. In their December, 1948, Bulletin it states that their compensation rates on roads and streets in 1935 was $7.00 and in 1948 it dropped to $2.38. It also contains a highly complimentary letter from the Council of the Union involved, pledging their full support in safety and accident prevention.

Let's again refer to a statement in "Construction" of the United States Department of Labor:

"A high degree of hazard is admittedly present in construction work. Most construction hazards can be overcome, however, through application of safety principles. Fundamentally, the accident record of the construction *(To page 60)*

Photoswitch Appoints

PHOTOSWITCH Incorporated announces the appointment of Mr. Oscar C. Stark as General Sales Manager with headquarters in the Factory Sales Office, 39 Broadway, New York City.

Mr. Stark has severed his association with the Square D Company, with whom he had been connected in various sales and management capacities since 1930. Mr. Stark received the degree of B. S. in Electrical Engineering from Tufts College. Before joining the Square D Company, he was associated with the New York Sales Office of the General Electric Company. He is an associate member of AIEE, past president of the Bergen County Electrical League, and recently chairman of the manufacturers division of the Essex Electrical League, Newark. He is also a licensed Professional Engineer in the State of New Jersey.

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LEARNING THE

HARD FALL

AN EMPLOYEE who was assisting carpenters in the dimly-lighted attic of an office building, stumbled over electric and telephone wires lying along the floor. Missing the two by four rafters, he fell through the sheet rock ceiling to the floor below. Better lighting is essential in any area where work is being done. Also portable walkways or platforms to rest on the rafters are almost a necessity for attic work.

A "SPARKED" PLUG

AT THE same time a fireman was repairing light plug, another employee needed power and turned on generator. The system short-circuited, and the screwdriver with which fireman was working welded to the plug.

This accident was caused by lack of understanding between employees concerned. Anyone wishing to use or repair any part of the lighting system should notify fireman and ask him to be present when the generator is turned on.

VOLATILE LIQUID

EMPLOYEE had a small beaker of benzol in his hand with which he was cleaning a viscosity flask. A draft from an open window carried the benzol vapors to the open flame of a water distillation machine about 5 feet away. The vapors flashed back to the beaker, causing the employee to throw the beaker, spilling the flaming contents over his face and body. Before being able to extinguish flames with fire blanket, employee had swallowed enough flame to cause his death.

Precautions have been taken to prevent a recurrence of this type of accident: Use of carbon tetrachloride as agent with instructions as to handling. Replacement of open-flame water-distillation equipment with vapor-proof electrical equipment. Educating employees as to necessity of safety vigilance.

FALLS FROM LADDER

LADDERS, especially steep ladders, aren't made to hold more than one man at a time if they are to be safe. A worker, hurrying to get out of a ship's hold crowded the man above him on the ladder. The top man slipped and the man below was knocked off. He fell into the hold, severely injuring his head and neck.

VALVE UNKNOWN

TWO sprinklers made short work of a recent fire in a department store. Damage would have been slight had employees on duty been familiar with sprinkler valves. It was early morning and the janitors and door guard did not know the location of the proper control and drain. Water ran for almost an hour before a maintenance man arrived and closed the valve. Damage, largely wet down, amounted to about $5000.

Are one or more persons who understand your fire protection system on duty at your plant at *all* times?

HARD WAY

SHIFTING LADDER

THE pipe-fitter's helper was descending what should have been a good sturdy ladder. When part way down, the ladder shifted causing the man to fall to the pier above which he was working. His accident resulted in the complete loss of use of one leg, almost two years' disability, and certainly a great deal of money, both in medical fees and compensation. Checking over ladders frequently to see that they are in good condition and also providing ladder shoes, will do a lot to prevent accidents of this type.

LOSES ARM IN ROLLS

A STEEL plant employee lost his right hand when it was drawn into a set of rolls.

The accident victim, a roll changer, was attempting to place a wooden block in position in the rolls when his glove caught and his arm was drawn into the rolls, crushing it so badly that it was necessary to amputate above the wrist.

It is generally accepted as good safe practice not to wear gloves when working at rolls, gears or sprockets.

FORGOT

FORGETFULNESS can be dangerous when the thing forgotten is the use of safety appliances. A press operator removed the pan from a press and then forgot to adjust the safety before starting the press. His finger was amputated.

TRASH FIRE

A LARGE pile of trash, unwisely left near one of the buildings of a woolen mill, caught fire, presumably through a smoker's carelessness. The fire was so intense that it opened seven sprinklers in the building, near the windows. They kept the fire out, and city firemen extinguished the trash-fire, but heavy smoke entered the mill and saturated a storage of 12,000 pairs of heavy woolen pants and 1000 yards of cloth. There was considerable damage to the building also.

Trash or other waste materials should be removed from buildings and disposed of in incinerators or at a dump well removed from plant buildings.

LINEMEN BURNED

TWO employees of a power company were making a routine check of terminal poles. While they were working on the pole, a wrench which one of the men carried in his belt swung under the protective rubber blanket being used on the job. This grounded the live wires and both men were burned painfully, one suffering flash burns in the right lumbar region and on both elbows and the other burns on his hands and face. Both men were hospitalized temporarily.

Common prudence would suggest that if metal tools are to be carried in such work, they should be so placed as to insure them against contact with live wires.

Why a Safety Program?

(Continued from page 57) industry is more indicative of inattention to safety principles than of the inherent hazards of the work.

"Evidence to support this conclusion is apparent in a comparison between the injury-frequency rates of private contractors engaged in work for the Corps of Engineers of the United States Army and of those engaged in non-Federal work. The standard contract for work under the Corps of Engineers specifies that safety supervision must be provided and the specifications for the work outline basic measures for controlling known accident hazards. Enforcement of these provisions by inspectors of the Construction Forces of the Corps of Engineers has consistently resulted in much lower injury-frequency rates for work under their jurisdiction than has prevailed in other construction work."

These figures show that the work supervised by the Corps of Engineers was from two and one-half to three and one-half times better in accident frequency. This statement registers but one thing in my mind and that is legislation. In other words, if contractors don't do it the Department of Labor can show them how. This terrific waste of manpower cannot and should not go on.

Selling Safety to Supervisors

Several years ago, the Steel and Metal Erectors Association of Michigan was alarmed about compensation insurance rates, and the frequency and severity of accidents. Our company was greatly interested, as we had to pay a rate set up by the Compensation Bureau, which as you know sets a rate in accordance with the experience rating of our industry in our state. In 1943 the Bureau rate for structural steel erection was $31.57 per $100.00 of payroll. Our company had a debit rating of 14% so our rate was $36.00. Some of our competitors, however, had definite safety programs and safety rules and regulations. They were using in that year a rate of approximately $7.00 against our $36.00 per $100.00 of payroll, an advantage of $29.00 per $100.00 of payroll over us. When overhead and profit were added, it meant a difference on the average steel erection job of $5.00 per ton. What chance did we have of competing against them? Something had to be done.

Our Association organized, through the Detroit Industrial Safety Council, affiliated with the National Safety Council, a series of dinner meetings, to which we invited management, supervisors, and all foremen engaged in steel erection in our area. The companies need not be members of our Association or of the Safety Council. We asked each company to pay the cost of the dinner for all of their representatives. We plan our programs. We have specialists in their fields address us on the safe use of our equipment, safe ways to work, fire prevention, first aid, etc.

We conduct five meetings a year on definite dates. We keep a record of our attendance, and previous to each meeting we send a post card to the home reminding everyone of the meeting.

Our results were instantaneous. We discuss mutual problems. We stress the cost to our men in the possible loss of pay and from union assessments paid to their members due to accidents. Nothing but safety and accident prevention is ever discussed. We want to emphasize that all of our discussions are sincere and earnest. There is a definite yearning by our supervisory employees for information on accident prevention. Anyone who has ever attended these meetings will attest to these facts.

After an address, we have a discussion period, which is the most important part of the meeting and the most fruitful. Our men make suggestions and criticisms, sometimes with very effective good natured kidding, as when one of our foremen appeared with a knot the size of a billiard ball on his head. We found he had been hit by a crane block and wasn't wearing a hard hat. We have a committee to investigate serious accidents and to act on suggestions. All serious accidents are reported and discussed at each meeting.

At our December meeting four serious accidents were discussed, two deaths, one permanent and one partial disability. Upon investigation we found that in each of these cases, the companies involved and the foremen on the job had never participated in any of our meetings. Naturally they were immediately invited. You see we have to pay for their accidents. Why? Because our insurance rates are set on the cost of all accidents.

Selling Safety to the Workers

The foreman holds a job meeting the day after our meeting, and explains to his gang what he has learned the previous night. Some-

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times we suggest he hold weekly meetings, for about 10 minutes on a Monday morning, with some safety suggestions to the men. They inspect all equipment.

Our company sends to each foreman at his home once a month, a report showing his experience, number of hours worked, accidents if any, total lost time, and cost, with some explanations and words of encouragement. Believe me they watch these reports very carefully. No foreman wants his record marred.

The monetary results have been remarkable. The compensation rates for riveted steel erection have decreased in the State of Michigan from $31.57 in 1943 to $12.11 this year in which they gave us the maximum allowable reduction of 25% from last year, and in other steel erection from $15.62 in 1943 to $4.92 this year, and these rates will keep on going downward, as they are predicated on 1944 to 1946 experience. The remarkable feature of these statistics is shown by the fact that in 1940 our total payroll was $166,400.00 with five serious accidents, 39 non-serious, with total losses of $46,461.00, as against 1946, when we had a payroll of $980,000.00, one serious loss, 32 non-serious, and total losses of $38,683.00, a 600% increase in payroll and a 20% reduction in losses.

Our company had a 5% credit on a base rate of $28.95 in 1944, a 26.1% credit on the lower base rate of $17.57 in 1947, and this year we have a credit of 42.1% on a still lower base rate of $12.11, or a net rate of $7.01 for steel erection insurance as against $36.00 in 1943, a saving on every hundred dollars of payroll of $29.00. In 1947 we had a refund of $16,400.00, and in 1948 a refund of $18,700.00. The reduction in compensation rates for steel erection means a savings to our industry in Michigan on a payroll of approximately $3,000,000 of $583,800. This is a part of what we have accomplished through our program in a period of four years.

We think these results are really worth all the time and effort we

(Continued next page)

"Supervisory Training: Case Studies"

IN A competitive economy, where all resources, material and human, are available to all competitors, the proper training of supervisors can be a controlling factor in the progress of a company.

This fact was stressed again and again by executives who cooperated with the Policyholders Service Bureau of the Metropolitan Life Insurance Company in gathering case material on supervisory training. This material has just been published in the report, "Supervisory Training: Case Studies," which was issued as a part of the Metropolitan's continuing program of services to Group-insured companies.

Purpose of this report is to provide executives interested in supervisory training with actual and specific examples of how other companies train their supervisors, so that they may have a means of comparing their own methods and practices with those used in successful programs in other companies

The executives cooperating with the Bureau describe phases of their own or their companies' experience in supervisory training. Here are the subjects they discuss in original signed articles:

Supervisory Training Programs; Improving Group Discussion as an Aid in Attaining Management Objectives; Training by Lecture-Discussion; Determining Individual Supervisory Training Needs; Initial Training for the New Supervisor; An Executive Development Program; An Education and Training Program for Supervisors; Supervisory Training in Small Operating Units; Developing Leadership; and Multiple-Management's Role in Training.

Executives who would like to examine this report may obtain a copy by writing to the Bureau on their business letterhead. Address: Policyholders Service Bureau, Meropolitan Life Insurance Company, 1 Madison Avenue, New York 10, N. Y.

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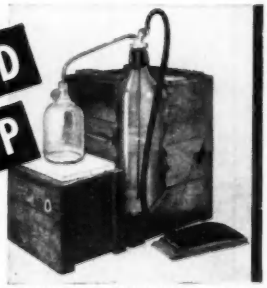

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have expended. Our men are safety conscious, and we are determined to keep them that way, but we of the local structural steel industry cannot do the job alone.

Our own section of the construction industry together with all other segments of the industry must do a similar job to produce a better safety record for the industry as a whole. This must be done through our own cooperative efforts, otherwise we will be forced into a program through legislation, restrictive measures, and safety codes arising from sources over which we have little or no control. We may be told what types of scaffolds to use, from whom we shall buy our equipment, how many men we shall use on a piece of equipment, and how many men it requires to do a job. It is of little use having just one section of the industry safety conscious. We know in our own industry that a great many serious accidents could have been avoided if other trades had worked with us in accident prevention.

There is a case of a bricklayer, who was totally and permanently disabled, because he was told not to work around our steel erection. The foreman told him the job had to be done, to go ahead and do his job. He was hit on the head by a piece of steel, lost a part of his brain.

A steel erector was disabled because of the faulty setting of anchor bolts. A contractor thought it was easier to cut off the anchor bolts and pour concrete around them after they had forgotten to set the bolts, than to knock the concrete out and pour new footings with the proper bolts.

During 1948, in one automobile plant in Detroit there were four steel erectors killed. In every case we found that these deaths could have been prevented. In one case the widow sued the company for $100,000.00. It was settled out of court for $35,000.00. This can mean the difference between a profitable year and a very unprofitable year.

We argue a great deal with our employees about giving them a nickel or dime increase per hour. Here in the case of steel erection we have shown you a saving of 20% in insurance rates, which means 50c per hour. It makes no difference whether it is in the man's wages or insurance, it is still a part of the cost of the job.

However, let us not be under any delusion that our premium rates have been lowered solely because of accident prevention. We have two contributing factors. Increased payrolls and full employment. A man preferred to work for $125.00 a week rather than be on compensation at $21.00, and we were glad to let him work. Conditions are changing rapidly, and rather than be unemployed, he'll be on compensation.

We need more effective control over our serious injuries. That is one of our industry's present problems. We can't sell safety by posting bulletins and posters at the job site. It may help, but we've got to do more than that. First, management must be sold 100% on safety. Next we must sell our supervisory employees, who in turn must sell their men.

A safety program is not something we can start and stop. It must be continuous, day after day, week after week, month after month. Sometimes it is very discouraging. One contractor in Detroit worked 18 months without a serious accident, and all of a sudden there were three fatalities in a period of three weeks.

Recently this same contractor, on the Detroit Edison job, insisted on 100% hard hat coverage. If you didn't wear a hard hat, you couldn't work on the job. And that applied to everyone, subcontractors, engineers, and supervision. The owners accepted the program and their men cooperated 100%. Four probable fatalities, and five serious accidents were prevented. This meant a saving of about $95,000.00 in insurance costs.

Conditions have changed, so we can enforce safety regulations. Our rule should be "Do it or else," and it should apply equally to the general contractor and all subcontractors. One contractor now has a clause in his contract making the subcontractor abide by the regulations and decisions of their safety department.

In conclusion, it is my personal conviction that a planned safety program, incorporating the three E's, education, engineering, and enforcement, followed by a thorough training, with sustained follow-up, should be carried on by all sections of the construction industry. It should be directed by the national association and the local chapters, and it should have the fullest cooperation. It has been definitely a profitable undertaking for us, and we feel certain others can obtain as good or even better results. As pointed out previously, if we don't do it, someone will do it for us. We have licked bigger jobs than this, let's lick this one too.

From an address presented at the 30th Annual Meeting of the Associated General Contractors of America.

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What Happened To Whose Back?

By DR. JAMES K. STACK, M.D., Assistant Professor of Bone and Joint Surgery, Northwestern University Medical School, Chicago, Illinois.

PERSONS engaged in safety and accident prevention work have no doubt had frequent and perhaps harassing experiences, both personal and in the line of duty, with back strain. Its importance as a cause of lost time and its notoriety as a cause of compensation adjustment difficulties need not be emphasized.

Picture the man who appears at the dispensary, usually between two fellow-workers, inclined obliquely forward from the hips, his hand pressed to his back, his face distorted with pain, pupils dilated and pulse rapid—the typical picture which follows the sudden onset of acute back pain. He was, let us say for purposes of illustration, lifting a heavy object with a co-worker; his foot slipped on a grease spot and an unusual strain took place. In the effort to save himself from falling beneath his end of the load he twisted his back.

Or another man, after taking a 35-pound package from an overhead shelf, placed it on the floor in a cramped storeroom; he did not have room to bend his knees so put it down with his spine flexed. Starting to regain the erect position he said, "someone hit me in the back with an axe. I dropped in my tracks and everything went black." Another typical patient is the one who suffered a supposedly minor back strain, lost no time from work, and reported to the dispensary three days later. He received appropriate conservative local treatment while remaining on the job, but three months later he still had the pain and, in the interim, was not the efficient workman he had been before. He now amplifies his story by saying that whenever he works in his garden at home, washes his car, empties the ashes, etc., he is so stiff and sore the next morning that he can hardly get out of bed. Being dissatisfied with the lack of prompt results from the treatment received at the plant, he consults his family doctor and a diagnosis of "lumbago" is made. He gradually improves, and then six months later he again sustains a minor lifting strain. Now, for the first time, the pain is referred down the back of one leg. This pain is greatly accentuated by coughing and sneezing, and now we have the complication of sciatic nerve root irritation or compression and the problem of differential diagnosis is broadened.

These rather homely incomplete clinical pictures serve to project the problem of back strain into bold relief. The structures usually involved in ordinary

back strain and sprain are: muscles, tendons, ligaments, fascia, blood vessels, nerves, joints capsules, cartilage, and the elements of the intervertebral disks. In the problem of back strain, any or many of them may be involved.

The Individual Back

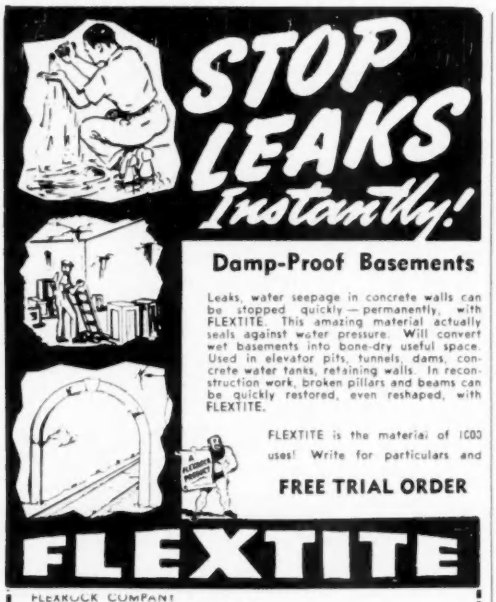
One of the principal factors in the problem of back injury is, "Whose back has been sprained?" Not the identity of the man, but the identity of the back. What does it look like? What did it act like before? What is its true bone age? In other words, is it a normal or average back? It is of utmost importance that this question be answered at the time of the original examination, and this information can be obtained only by adequate physical examination and x-ray study. If this is not done, an opportunity for a valuable record is lost, and a reasonably accurate prognosis of return to a full productive schedule cannot be given.

What is a normal back? We might go on from there and ask what is a normal blood pressure, or pulse rate, or body temperature. What is a normal face? Faces are completely dissimilar, yet we like to think that each of ours is normal. And so it is with backs. Some are long in relation to leg length; others are short. The curves in the low back and chest area may vary greatly. Joints may be set at different angles, and so forth. And yet they all may fail within a so-called average range. It is an established medical fact that about 10 per cent of all backs will have congenital or developmental variations which represent true architectural defects and weakness in the area where the spine joins the pelvis. It is only by physical examination that such defects will be suspected, and only by the x-ray will diagnosis be substantiated. Asking the man to pull up his shirt or loosen his belt, poking him a time or two, then suggesting a hot water bottle when he goes to bed that night, is no longer enough, as if it ever was. Of course many minor back injuries will recover with neither diagnosis nor treatment. We, however, are interested in the real problem of the sprained back, and in this problem we must consider such items as patient disability or dissatisfaction, or both; the reflection of his trouble on his fellow-workers and his employer's liability.

It is imperative, then, that as exact a diagnosis as possible be made as soon after the injury as is practicable. Back strain or sprain is not a diagnosis, any more than is "bellyache" or "cough." No right-minded surgeon would operate on a patient with a preoperative diagnosis of "bellyache" and to treat a patient for a cough without differentiating between the numerous causes is certainly not considered high-grade medicine. Backache is a symptom, not a disease. In back injuries we must also ask ourselves what has been injured—skin, fascia, muscles, joints, ligaments, bones, or cartilage—and where? Then we return to our former question—whose back? How well able is this back to accept and then throw off the unusual demands that have been made upon it, and that, after all, is simply what strain is. Can the back under consideration "take it" and come back for more. The structurally weak back will not, as a rule, respond favorably to unusual demands, either the sudden demand of a blow or twist or the gradual constant demand of poor occupational posture. A tree or bridge or building or back that is constantly subjected to cross-strain will sometime give evidence of weakness and subsequently it will collapse. The dual question, then, "What has happened to whose back?" is the essence of the whole problem and should be answered in detail.

Careful Diagnosis

Men in safety and personnel work are of necessity in close liaison with the medical department, and therefore are in a position to press for early and more accurate answers to these important questions. If an x-ray is not taken the first time a back is injured, later x-rays may reveal changes that may wrongfully be ascribed solely to the injury. Make the initial study of the back case as complete as possible, for if you don't, someone else will. A complete study will not only give the patient full benefit of adequate early diagnosis and care, but will create a good will which will benefit the employer if a recurrence ensues, or if the patient should fall into unethical hands. We all know that the lame back is the "happy hunting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Address

ground" of the "easy money" elements, and complete initial study can do much to thwart them.

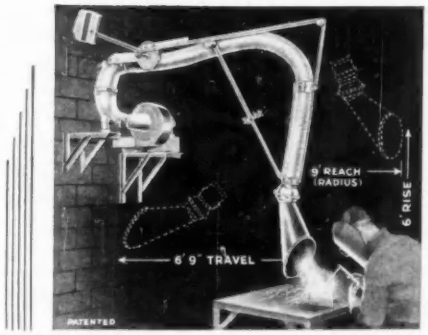
A pre-employment x-ray study of the lumbar spine has been suggested as perhaps the best way to screen and reject bad risk backs. I do not believe this is necessary nor entirely fair. In the first place, an adequate x-ray study of the back takes time, and it is necessarily expensive, and only those familiar with back problems can properly interpret the many variables that are seen in the x-ray. Also, it is not always fair to reject a man for employment because of a congenital anomaly in the low back. Usually the anomalous back in adolescence and young manhood will hold up well because of the pliable and easily adaptable structures that support it. Compensatory movement and compensatory support can be and will be developed. It is in the later years, when soft tissue resiliency is no longer present, when the threshold of pain and discomfort is no longer as high, that the faulty back may begin to show signs of weakness and collapse under undue pressure. But in industry many of these people will have by that time advanced themselves to the point where their work is executive or supervisory, and they are in a position to "let George do it" while they tell George how. Rather than wholesale rejections of all congenital anomalies in the pre-employment screening of backs, the individual defect should be analyzed in the light of the prospective job. Minimum risk assignments can then be made.

What Is a Strain?

Strain, as opposed to sprain, we may think of as a stretching or "giving way" within the limits of the tolerance of the tissue involved. A bamboo pole, for instance, has a high tolerance; an ordinary wood pole has not. Skin, muscle and tendon with a natural elasticity has a higher tolerance than the denser fibrous structures such as ligament, bone and joint capsule. When the inflammatory reaction following strain subsides the case may be considered closed. No actual repair is necessary. Sprain, on the other hand, means actual tearing, and a definite and sometimes prolonged healing process is necessary for recovery. Some of the more highly specialized tissues are not capable of regenerating themselves, and scar tissue replacement is all that can be hoped for. Normal function may be attained only after a long rehabilitation period and, indeed, the question may be asked: "Is this tissue ever again as good as it was before?" Anatomically it may not be, functionally it frequently is. This is the basis for the old familiar expression: "A sprain is worse than a fracture," because some tissues do not heal as kindly, completely, or as rapidly as bone.

What Is a Sprain?

Sprains involve the supporting structures of joints and, of course, vary in degree. An example of a most



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Resists animal fats, vegetable and fish oils, chemicals, hot soapy water, polishes, lactic acids, gasoline, kerosene, heat and sunlight—all enemies of rubber.
Reduces fatigue, speeds up production.
Reduces breakage.
Combines Gro-Cord, exclusive cord-on-end construction with Dupont Neoprene to provide the world's greatest non-slip material. The cords are the identical high grade native long staple sea island cotton such as employed in the manufacture of finest tires. Ridges on the top and bottom faces afford a safe walking area, drainage and aeration.
Made in sections which are heat vulcanized together to form strips 23⅝" wide and of any length in 12⅛" multiples.

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New Worker Comfort in This Elastic Knit-Lined Neoprene Glove

This Stanzoil Duplex NL-34 is designed expressly for, and is sold only to, industry. Elastic-knit lining stretches with every hand movement, gives new worker comfort and protection, more freedom than old-style flannel linings. Slip on and off easy as a cloth glove. Non-slip finish holds oily objects in a sure grip. Chocolate-brown DuPont Neoprene resists damage from oils, acids, caustics. Stanzoil NL-34's give you comfort and protection at lower cost per hour. Sizes small, medium and large. Larger Duplex Gloves, Catalog No. NL-42 and NL-52. Ask your supplier or write for informative catalog today.

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severe sprain would be a dislocation. Here the supporting structures are so completely disrupted as to permit the joint to part.

We are not in a position to prove that certain definite changes take place in the spinal joints following sprain, because these patients do not die and autopsy material is not available. Nor are the parts seen in the operating room; surgery is never indicated in the acute phase. However, the clinical picture is a typical one and deductions can be safely made from it. The spasm of the muscles of the back, the characteristic attitude involuntarily assumed by the patient, the definite limitation of certain motions, the common reference points of pain and the constant points of tenderness, all fit into a pattern which coincides with the disturbed anatomy and physiology of these joints.

Even following treatment, recovery will be slow, for these structures must be protected and supported during the rehabilitation period. Give the patient the benefit of the doubt, give him a break so far as work and hours are concerned. Be sure that every reasonable diagnostic and therapeutic measure has been considered before the words "neurotic" and "malingerer" find their way into his file.

Remember that these backs hurt, and that, many times, the threshold of pain in such a patient will be lowered by an apprehension that is altogether reasonable concerning his future ability to perform manual labor. Remember that the issue cannot be forced, and that there are few industrial injuries that will require more patience in order to bring about a successful conclusion. There are neurotics and there are malingerers. Some of these are born, but many are made by the inept handling of the situation in the beginning. Backache is a symptom and not a disease. Insist on the answer to the question—"What has happened to whose back?" This question can and should be answered early in the game, for only on this answer can proper medical and personnel management be followed.

From an address presented before the 24th annual Midwest Safety Conference.

Solvent Illness

WORKERS handling volatile solvents should be instructed to report promptly any feeling of discomfort, warns the Safety Research Institute, Inc. Dizziness, headache, eye difficulties, weakness, nausea, or stomach upset may be due to other causes, but they can also result from inhaling solvent vapors and may serve as an early warning that medical attention is required. Neglect of such warnings may lead to serious illness. Prompt medical attention, on the other hand, generally leads to complete recovery.

In one instance, a man spent several hours cleaning some equipment with a substantial quantity of solvent in a basement room where there was little ventilation. Several times he felt a little dizzy and went outdoors for a few breaths of air and to get away from the odor. Since this made him feel better, he said nothing about his discomfort but kept at the job until it was finished. The next day he felt much worse, and by the time he consulted a doctor he was seriously ill and had to be sent to the hospital.

In another case, a man entered a solvent tank to clean it, and made the serious error of entering the tank without a respirator. He became ill from the heavy solvent fumes and, instead of reporting to a physician, tried to treat himself by taking a few nips of hard liquor. A doctor would have told him that alcohol intensifies the effects of solvents on the body. His self-treatment led to serious illness.

Some persons are especially susceptible to solvent illness, and even a rather mild exposure (degreasing a motor or wiping metal parts with a solvent-saturated cloth, etc.) may lead to illness. For this reason, early signs of discomfort should not be overlooked even when it seems unlikely that much solvent has been inhaled.

While inhalation of solvent vapors is the most frequent source of solvent illness, it sometimes happens that the liquid is swallowed by mistake. The person should be made to vomit and a physician should be called at once. Also, since skin contact with solvents sometimes leads to dermatitis, persons who develop skin difficulties after working with these liquids should report to a physician to prevent aggravation of their condition.

THE INDUSTRIAL Nurse

EDITOR

ROSAMOND J. WEBSTER, R.N., A.M., Ph.D.

Achieving Results

FIGURES have been made available which indicate a wide variation in the death rates from tuberculosis in the several parts of the country. The measure of success achieved in dealing with this major public health problem is a key to the validity of medical, institutional, and health education programs. Economics also plays a part in the whole picture. In 1948 the deaths per 100,000 population from tuberculosis reached a low of 9.0 in Iowa, 9.5 in Utah, 11.6 in Wyoming, 12.9 in Nebraska, 12.2 in Kansas, and 12.5 in Idaho. On the other hand Tennessee had a rate of 45.3; Maryland 45.2; Louisiana 38.7; New York 35.7; Alabama 35.2; Georgia 31.9; Illinois 30.1; Pennsylvania 28.7; Massachusetts 28.4. Several questions will stir those who are statistically minded. Why the variations? Why the high rates—comparatively—for New York, Illinois, Pennsylvania, and Massachusetts? Full answers cannot be given at this time. Case finding methods, availability of medical facilities, high standards of reporting cases, housing facilities, industrial hazards, wage levels, personal habits—all these and others play their respective parts in the whole picture. Looking backward, we can compare our present-day death rates, whether comparatively high or low, with rates 200, 300, and even 400 per 100,000 only a comparatively few years ago. Much has been accomplished through the application of public health measures in the community as a whole. Industry has done its part in many areas.

Documentation

A RECENT news item carried the story that the leaders in a number of large industries are having data compiled relating to the development of their particular establishments. It seems that a realization of the import of the modern industrial system is helping to focus attention on the desirability of adequate documentation. This is not altogether a new idea. Critical, laudatory and variously slanted accounts of many businesses have been published for several decades. But the present turmoil in both the western world and, more seriously in other areas, may well warrant the type of study being sponsored and initiated on behalf of American business. How does this affect the industrial nurse? She functions in an area which is unproductive in the technical sense. To judge from legislation already enacted and other proposed legislation on federal and state levels, industry will in the near future, if such legislation is enacted, become more and more involved in non-productive responsibilities. To meet the implied challenge—the one of adequate documentation of activities of the industrial nursing service; the other, the availability of satisfactory records and a system of indexing responsibilities in socialized activities that may be required by law, the industrial nurse faces some new tasks. She needs to develop some sense of historic values. She may need to analyze her record-keeping critically. Help from some available personnel may be implied.

In England

MANY are fairly well informed regarding the developments in England relating to the practice of medicine. The nationalization of medical practice has had many related and side effects on the general population, physicians, nurses, hospitals, dentists, and industrial medical practice. An interesting item appears in a current issue of the British Medical Journal (July 9, 1949). It seems that a practice has been developing in certain parts of the country whereby patients are being asked by their own panel doctors to go to the factories where they are employed and get treatment there for their complaints and accidents. The changing circumstances of industrial life and the pressure on medical practitioner's time has brought about new ethical and social problems. In some areas this type of reference had become so common that it was being discussed as a real industrial issue. In the light of the widespread discussion of the subject of health insurance in this country, of the official position of the American Medical Association and other local medical societies, and of the differences of opinion voiced by other interested groups, this item from England is of interest. Whether or not such pressure would develop on panel physicians in this country, if health

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or medical social insurance became law, is worthy of serious consideration.

Sunlight

THIS is the dangerous season of the year insofar as exposure to sunlight is concerned. The attempt to get a one-day tan at the beach or on a fishing trip may lead to serious consequences. Just a bit of observation at bathing beaches, especially toward the end of a hot, clear day, will give ample evidence of those who will be too sick to report for work the next day; of those who will come to the industrial nurse for relief from stinging and inflamed skin surfaces. The dark-haired brunette skinned individuals are less susceptible to the effects of the sun than blond, fair skinned persons. A word of warning to the latter group before a week-end may save some from their own foolish conduct, and may help to keep down the absentee rate. Aside from temporary discomfort which may last from a day to a week, if no serious consequences follow immediately, long exposure to the hot sun may lead to skin cancer. Severe and repeated exposure to sunlight has long been recognized as a paramount factor in the causation of cutaneous cancer. Some words of counsel are in place. A good job in beach education by the industrial nurse early in the summer and throughout the summer will help to avoid many total days of distress and other untoward consequences. Now is the time to talk about the sun.

The Use of Penicillin

THE use of this "wonder drug" has brought about many marked changes in the practice of medicine and surgery. From the laboratories of pharmaceutical establishments, as well as from hospitals, medical schools, and independent research workers, regularly come forth new reports and new methods of using this newly available therapeutic agent. Some warnings have also been issued from these research centers. One in particular relates to the fact that giving penicillin often hides conditions that need careful study and diagnosis. Further, ultimate diagnosis may be made difficult in many situations. Emphasis has been placed on the fact that in conditions requiring observation and careful study before a correct diagnosis can be made, the giving of penicillin as an emergency measure may so hide the fundamental facts that would be the guide to a correct diagnosis, that the patient may even die before this has been done. There has been a tendency among some to take penicillin in one form or another for symptoms which are only such and not the true cause of the illness. When needed in fairly large quantities, penicillin may be virtually ineffective in such individuals. Industrial nurses can help by refraining from advising the use of penicillin without competent medical advice. It is taken for granted that they will not administer or recommend such use on their own account.

Accident and Health Insurance

A SURVEY of accident and health coverage in the United States as of December 31, 1947 showed that an estimated total of 31,224,000 workers were insured under some form of voluntary protection against loss of income due to sickness or accident. This represents more than one half of the 58,000,000 employed civilians in the United States. Also, 52,584,000 individuals were protected by some form of hospital expense coverage; and 8,898,000 had medical expense coverage. These latter figures include dependents of workers as well as the workers themselves. The increasing demands of organized labor for social insurance benefits, including old age, disability, hospital, and medical care, are indications of current trends. Disability compensation through state laws represents another facet of this changing picture. Under a New York law passed in April of this year, benefit payments are made ranging from $10 to $26 a week for a maximum of 13 weeks for persons who become ill while working, or while drawing unemployment insurance, and are not covered by existing welfare places. Pending federal legislation would have an immense effect if it should be enacted within the next few years. All of this has a direct bearing on the activities of industrial nurses who should keep themselves informed of these developments. Questions of employees and supervisory personnel can be handled freely and accurately if the information is at hand in printed form.

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New publications of manufacturers are offered by SAFETY ENGINEERING Reader Service Department as a convenience to executives. Featured catalogs, data sheets and technical bulletins present the latest information on protective products and equipment.

ELECTRICAL & LIGHTING EQUIPMENT

Approved Lighting Fixtures for Hazardous Locations 1

Safe Lighting, Inc., Interesting, 4-page booklet describes and illustrates a new, air-pressure, explosion-proof incandescent lighting fixture for use in hazardous locations. The booklet should prove extremely helpful to those in the chemical, paint and petroleum industries, since this fixture is the only one approved by Underwriters' Laboratories for Class I, Group A and B hazardous locations. A complete description of the unit and its uses is given.

GUARDS AND ACCESSORIES

Power Press Feeding Equipment 2

F. J. Littell Machine Co., New, 4-page bulletin describes PRES-VAC air operated vacuum feeders and mechanical pickers. Cross-section diagram shows the feeder, with the component parts numbered and described thoroughly. A test graph, based on tests conducted by the Armour Institute of Technology, shows that peak performance is indicated at 451 lbs. air pressure. Another test shows 21 to 22 inches of mercury developed by the feeder, as compared to a perfect vacuum of 29.92 inches of mercury.

TOOLS AND ACCESSORIES

Non-Sparking Tools 3

Ampco Metal, Inc., Complete information is given on the full line of AMPCO Safety Hand Tools for industrial use. The booklet describes in detail the construction of each tool, and special emphasis is placed on the properties of the non-sparking metal from which tools are made. If your manufacturing processes involve explosive atmosphere hazards, this bulletin contains much helpful information on fire prevention for you.

FIRE PREVENTION EQUIPMENT

Check Lists on the Proper Handling of Flammable Liquids 4

The Protectoseal Co., New and extremely interesting 12-page booklet outlines the procedures to be followed in reducing the hazard of and loss by fire. Flammable liquids are covered completely in well-written sections entitled: Fire Facts, Production Line, Science Stops Fire, and Inspection Service. Seven Check lists for the handling of flammable liquids in Receiving and Storage, Fabricating, Assembling, Finishing, Maintenance, Laboratory and Shipping, are provided. These check lists willl enable you to make a quick, yet accurate, survey of your flammable liquids handling program.

FIRE ALARM EQUIPMENT

Fire Detecting Thermostats 5

Fenwal, Inc., One page bulletin introduces the new DETECT-A-FIRE thermostat for use in alarm systems in both ordinary and hazardous locations. Bulletin points out that this new thermostat, because of its stainless steel construction, permits a steady set point even under brief exposure to temperatures as high as 2000°F—yet offers sensitive response to temperature changes at any normal rate of rise. Manufacturing details, methods of operation, and approval specifications are given.

FIRE EXTINGUISHING EQUIPMENT

Dry Chemical Fire Extinguishers 6

C-O-Two Fire Equipment Co., Interesting booklet describes the new line of C-O-Two Dry Chemical extinguishers. Booklet gives complete information on the properties of dry chemicals; methods of using dry chemicals on various types of fires, etc. The operating principle of this unit, available in 20 and 30 lb. sizes, is explained thoroughly.

PERSONAL PROTECTION EQUIPMENT

Industrial Safety Equipment & Supplies 7

Averill Equipment Co.—New, 144-page catalog describes and illustrates the complete line of safety equipment handled by this company. The introduction to this book states that, "If it's for safety, you'll find it in our # 14 safety equipment catalog." Our own review shows that this statement is more than true. Hundreds of safety equipment items are cataloged and illustrated. Some general subjects covered are: Arm & Hand Protection; Eye Protection, Respiratory Protection, First Aid, Production Equipment, Fire Prevention Equipment, Welders' Protection and many, many others. Interesting chart shows what safety equipment to use . . . . and where.

Protective Equipment for Personnel 8

E. D. Bullard Co., announces the 1949-1950 issue of "Everything in Safety," a complete catalog of personal protective equipment and industrial safety devices. The catalog is divided into five sections: First Aid; Respiratory Protection; Eye Protection; Hats, Belts and Clothing; and Miscellaneous Safety Equipment.

Equipment for Accident Prevention 9

The Boyer-Campbell Co., New, 144-page catalog describes and illustrates the complete line of BOYER-CAMPBELL Safety Equipment for industry. Catalog # 100 covers the following groups of equipment: Eye Protection; Welding Accessories; Respiratory Protection; Atmosphere Analysis Equipment; Belts & Accessories; Arm & Hand Protection; Body & Leg Protection; Foot Protection; Acid Handling; Flooring & Mats; Skin Protection; First Aid; Educational Aids; Guards & Accessories; Lighting Equipment and Signs & Signals.

EYE PROTECTION

Improved Industrial Vision 10

American Optical Co., New, 24-page brochure describes sight conservation programs in industry. The booklet entitled: "Improved Industrial Vision, A Bonus for Management, A Benefit for Employees," features case histories and charts demonstrating the cost saving values of an industrial safety and visual efficiency program. The AO program, developed in cooperation with industry and the ophthalmic professions, provides a rapid check of vision under the supervision of members of the medical or optometric professions.

FIRST AID, MEDICAL AND HEALTH EQUIPMENT & SUPPLIES

Standardized First Aid Protection 11

The Pac-Kit Co., New, 8-page folder describes the PAC-KIT Unit Type System, which provides complete individual applications and dressings for each injury. Booklet describes thoroughly the components of each unit. The systematic arrangement of each unit is explained. 10 standard cabinets and kits are listed and the contents of each given.

WASHROOM SANITATION

Prevention of Athlete's Foot 12

Onox Co., Inc., New, 4-page bulletin describes the ONOX skin-toughening method of athlete's foot prevention. Booklet shows how ONOX prevents growth of fungus; toughens skin; protects the feet. The features of the ONOX foot mat are described completely.

EDUCATIONAL AIDS

Industrial Safety Awards 13

Williams Jewelry & Mfg. Co., Well illustrated, 8-page booklet presents the complete WILLIAMS line of awards, emblems and trophies for accident prevention, "safe driver," and service programs. Complete ordering information, including price list, is presented.

Industrial Training Films 14

Commercial Films, Inc., New, 100-page catalog describes and illustrates 327 currently outstanding ready-made films, projection equipment, and accessories. Among the many films described are those whose subjects cover: Supervisory training, industrial relations, mechanical skills, industrial safety, commercial vehicle safety, and health & first aid. Prices are shown for each of the many films described.

An Electronic Voice of Safety 15

American Allsafe Co., Inc., 4-page bulletin describes SAF-T-VOX, a small, compact unit for the recording and reproduction of safety messages. Booklet points out that SAF-T-VOX was developed by the General Electric Co. and adopted to the field of industrial and public safety by American Allsafe Co. Interesting test shows how SAF-T-VOX expands the safety engineer's educational program without putting a drain on his time. SAF-T-VOX will reproduce his message or warning as many times as desired wherever and whenever it is needed.

VIBRATION CONTROL

Vibration Control Qualities of Cork 16

Korfund Co., Inc.—New, illustrated 4-page booklet shows how cork may be satisfactorily used to control the transmission of vibration and noise from industrial equipment. Five forms of KORFUND Cork Isolation are presented in tabular form. A description of the material, its static load range, application, installation data and dimensions are covered thoroughly. Line drawings and other illustrations show how these installations are made.

WRITE NUMBERS CORRESPONDING TO THE ITEMS HERE ☞

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SAFETY ENGINEERING
75 Fulton Street
New York 7, N. Y.

September, 1949

NEW PRODUCTS

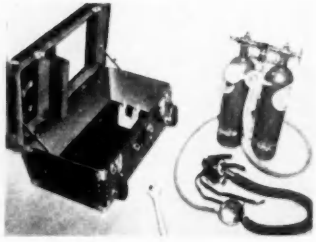
For illustrated descriptive literature of products listed in this section readers may apply

TO SERVICE DEPT., SAFETY ENGINEERING MAGAZINE

Edited by Geraldine E. Richardson

DEMAND INHALATOR

A NEW model of the Scott Oxygen Demand Inhalator is announced by Scott Aviation Corporation.



The Type "B" provides a completely self-contained "package" for more effective and greatly simplified administration of oxygen. Using Two "D" Cylinders (95 gal. capacity), it is furnished with oronasal mask, 6 foot extension hose, wrench, valve key, and instructions, completely ready for use.

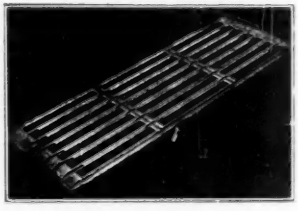
Securely retained in a sturdy carrying case, it is instantly removable by lifting the bail-type handle from its nest. It is easily attached to larger cylinders for service of longer duration.

All Scott Oxygen Inhalators are now equipped with a control providing, in addition to the time-proven Demand Flow, a constant flow at low pressure, "at the touch of a button."

A descriptive folder is available.

WOOD-LINK MATS

NATIONAL Safety Mats, surfaced with Minnesota Mining's Safety-Walk, combine all the fatigue reducing features of



a wood link mat with the safety features of Safety-Walk. They are unaffected by oil, grease, gasoline, water, most acids and alkalis.

The mat is built of seasoned hardwood cleats, 2½" wide, which are linked with cadmium plated wire and plates. Tubing spacers are non-corrosive aluminum. Safety-Walk is applied to the surface of each wood cleat with a permanent adhesive, but can be replaced.

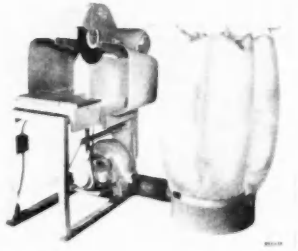
The National Mat Company, of New York, which manufactures these mats also makes special safety-pole mats of laminated rubber, 2 inches thick, to prevent broken legs and serious injuries to men using safety poles.

MASONRY SAWS

FIREPROOFER Masonry Saws offer many unique, exclusive features, such as dry cutting without dust, and automatic positioning of cutting table.

Four features common to all models of the "Fireproofer" line of masonry saws are:

1. An exclusive patented cutting table. To adjust for cutting material of varying thickness, simply lift . . . it automatically locks in place, easily lowered with fingertip control release levers.



2. All working parts of the blade assembly function as a single unit, mounted on a pivoted arm. This increases rigidity, eliminates parts and points of wear, and decreases vibration.

3. The frame is of angle iron. The protective shielding is of extra heavy gauge sheet steel. The whole is permanently welded into a single unit.

4. All saws, though ruggedly constructed, are portable and may be readily moved. Any average doorway provides ample clearance for their passage.

The Model 4DF is the "world's only" dry cutting masonry saw with a "built in" dust collector.

There is also a "Fireproofer" blade for cutting every type of masonry material. Diamond blades for wet cutting, and several types of abrasive blades for both wet and dry cutting. Not only will these blades cut all types of masonry material, but they will even cut through steel wire mesh, and rod reinforcement. Use the coupon.

SAFETY SCAFFOLD

DESIGNED specifically for painters and maintenance men, the new Gold Medal Midget Safety Swinging Scaffold, shown above, provides safe, fast, portable equipment.

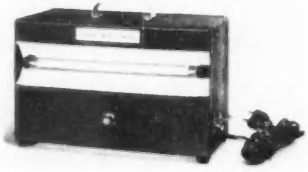
Introduced recently by The Patent Scaffolding Co., Inc., of New York, the scaffold is suspended quickly and easily from "S" or "L" hooks by means of 75' of ¼" plow steel wire rope. The scaffold is raised and lowered by the new light, compact Midget Machine which, according to the company, is light enough to be conveniently carried by one man.

Midget Machines have a pinion gear mechanism which assures speed in raising, and a worm and gear for smooth operation and safety in lowering.

The scaffold is locked at all times to prevent slipping or running down by the locking action of (a) three steel locking pawls (b) worm and gear lowering mechanism and (c) safety crank handle. Please send in the coupon.

LIGHT WATCHMAN

A BRAND new safety device provides instant, automatic light when the regular source of current is interrupted. When the current is restored the emergency light goes off automatically. The soft, glareless fluorescent light will provide approximately ten (10) hours emergency service with standard dry cell batteries which are obtainable everywhere. Uses standard Mazda fluorescent lamp. No special wiring needed. Plugs



into any 115 Volt A. C. outlet. It is manufactured by the Chatham Products Co. of New Jersey. Send in the coupon.

PROTECT AGAINST IMPACT, EXPLOSION

RECENTLY announced by Bausch & Lomb Optical Company are two new acetate-frame safety glasses designed especially for use where explosion or spark hazards are present.

The models, identified as Y-40 and Z-79, are similar except that the Z-79 is equipped with acetate side shields, perforated for ventilation, to prevent flying particles coming in oblique directions from reaching the worker's eyes.

Both models feature acetate frames which will not support combustion. They will be widely used, it is believed, by workers whose skin is sensitive to a metal frame.

Fitted with Ray-Ban glare-protection lenses, the Z-79 will protect the eyes of furnacemen, foundry workers, spot welders, employees in the vicinity of welding operations, and workers doing any of the semi-hazardous outdoor operations listed above where both impact and glare hazards prevail.

Both the Y-40 and Z-79 have modern drop-oval 6.00D curve safety lenses heat-treated for impact resistance, large acetate nose pads, and Ful-Vue construction. The Y-40 model, without side shields, comes in five different bridge widths, the Z-79 in three bridge widths.

Information may be obtained on either model by sending in the coupon.

"CHROMAN CLAMP"

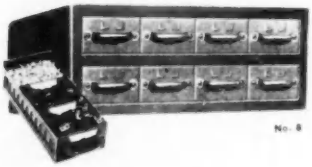
THE Chroman *Safety Rope Clamp* provides unique protection for swing stage and platform scaffold workers.

The clamp suspends itself by its own weight on the safety rope. Its easily adjustable feature provides quick repositioning up and down the rope. A lifeline four and one half feet long, runs from the clamp to the Chroman belt. This belt is specially designed of 3800 lb. webbing to provide light, cool and comfortable wearing. The shoulder harness positions the belt around the upper diaphragm.

In the event of a fall, the clamp grips the rope, sliding 10 to 12 inches downward while doing so. This slide acts as a shock absorber in breaking the fall. The position of the belt suspends the workman in a vertical position to facilitate his climbing to safety. For more information use the coupon.

STEEL DRAWER CABINETS FOR SMALL PARTS

EQUIPTO, Division of Aurora Equipto Company of Illinois, announces two new exceptionally strong and sturdy, low priced steel drawer cabinets. They were



No. 8

designed especially for nuts, bolts, washers, screws, nails, plumbing supplies, laboratory items, hardware supplies, drug items, notions, electrical parts, and innumerable other small pieces.

They can be used singly, side-by-side, back-to-back, and stacked on top of each other. Frames are welded into one strong solid assembly. Drawers have adjustable cross dividers on one inch centers. Lengthwise dividers may be added or removed at will. Label holders are furnished on every drawer and divider. Finished in olive green baked enamel.

Equipto #11 has 18 drawers, each with 3 cross dividers, giving 72 adjustable compartments. The overall size is: width 34", height 13¾", depth 12". The drawer size is 11⅞" x 5⅛" x 3⅛" high.

Use the coupon for further details.

CIRCUIT BREAKER PLUG

A NEW attachment plug that doubles as a circuit breaker has just been announced by Hopax Electric, Incorporated, of New York. The device, the Hopax Circuit Breaker Plug, as stated by the company, is designed to guard against dangerous overloading, stalling or rotor locking on any machine employing a fractional horsepower motor.

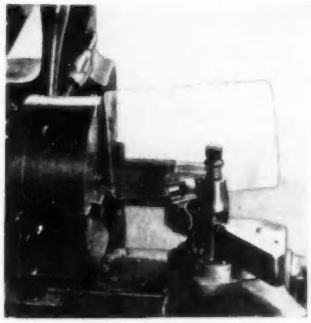
The Hopax Plug is simple to operate and is both tamper-proof and fool-proof. According to the manufacturer, to reset the plug it is only necessary to remove it from the receptacle, then raise and lower the lever between the prongs.

The Hopax Circuit Breaker Plug is available in a range of ratings up to 10 amperes and should be used at equal to the rated capacity of equipment it protects. The plug carries the approval of the Underwriters' Laboratories.

Complete information, prices and literature may be obtained by using the coupon.

LATHE SHIELD

LATHE operators are now assured of maximum protection by a new Plexiglass lathe shield which is easily attached by means of a spring clip to any cutting tool holder. Shield is 3" high by 5" wide and provides full vision of every cutting operation giving added protection to the operator. Fully and easily adjustable to any position, it deflects and concentrates all chips and shavings, making it easy to clean the lathe. Spring clips available for ¼", ⅜" and ½" cutting tool holders. Complete shield and spring clip priced at $1.50 each are made and sold by Frank Gradischnig Co., of Wisconsin. Please use the convenient coupon.



September, 1949

To SAFETY ENGINEERING

75 Fulton St., New York 7, N. Y.

For prices and complete details of items mentioned in this month's "What's New in Safety Products," check items that interest you and mail coupon.

- ☐ Demand Inhalator
- ☐ Wood-Link Mats
- ☐ Masonry Saws
- ☐ Safety Scaffold
- ☐ Light Watchman
- ☐ Impact Goggles
- ☐ Chroman Clamp
- ☐ Small Parts Cabinet
- ☐ Circuit Breaker Plug
- ☐ Lathe Shield

Firm Name .....

Attention of .....

Position .....

Firm Address .....

City .....

If You're Looking For:

- SAFETY BELTS
- SKIN PROTECTION
- PRESS GUARDS
- HAND & FOOT PROTECTION
- INDUSTRIAL TRUCKS
- LINEMAN'S SAFETY
- BUILDING MAINTENANCE
- FIRE PREVENTION
- WOMEN'S PROTECTION
- SIGNAL EQUIPMENT
- HYGIENE PRODUCTS
- WOODWORKING SAFETY
- AIR CONDITIONING
- VERMIN CONTROL
- EMERGENCY LIGHTING
- FIRE EXTINGUISHERS
- BODY PROTECTION
- SAFE ACID HANDLING
- EDUCATIONAL AIDS
- ATMOSPHERE ANALYZERS
- EYE PROTECTION
- WASHROOM SANITATION
- DUST CONTROL
- FIRST AID
- ARM & LEG SAFETY
- HEAD PROTECTION
- FIRE CONTROL
- RESPIRATORY PROTECTION
- LIGHTING
- FIRE DETECTION
- SAFE WALKWAYS

Consult your copy of

BEST'S

SAFETY DIRECTORY

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DANGER
NO SMOKING MATCHES OR OPEN LIGHTS

CAUTION
FIRE ALARM HANDS OFF

DO NOT USE ON ELECTRICAL FIRES

FOR USE ON ALL FIRES

THINK
A FIRE TO-DAY NO JOB TO-MORROW

NOTICE
KEEP THIS DOORWAY FREE OF OBSTRUCTIONS SO FIRE DOORS CAN CLOSE

USE ON OIL FIRES ONLY

CAUTION
PASSAGE TO THIS FIREHOSE MUST BE KEPT CLEAR

FIRE EXIT

One Match

MIGHT SET THE WORLD ON FIRE!

NOTHING is more devastating to the worker than to stand helplessly by while flames destroy his work place and his job.

And the worst of it is, the hand of Carelessness nearly always holds the torch.

STONEHOUSE SIGNS

For Accident Prevention

Teach your workers to mentally fight fire before it starts . . . by being careful . . . with the help of Stonehouse Fire Prevention signs.

Our complete Catalog No. 8, in full color, showing many "Fire" signs, is free on request.

"Stonehouse Signs Since 1863"

Stonehouse SIGNS, INC. MANUFACTURERS

Stonehouse Bldg. · 9th at Larimer
Denver 4, Colorado

ACCIDENT PREVENTION SIGNS IN STANDARD COLORS AND DESIGNS

For Industrial First Aid

Mercurochrome

Preventing infection is important in reducing lost time due to accidents. Even minor wounds may lead to serious infection and should receive proper first aid treatment.

Mercurochrome* (H. W. & D. Brand of merbromin, dibromoxymercurifluorescein-sodium) is especially suitable for first aid purposes. The 2% aqueous solution is not irritating or toxic in wounds.

Minor injuries are reported promptly when Mercurochrome is the routine antiseptic because treatment is not painful.

Other advantages are that Mercurochrome solutions keep indefinitely and the color shows where it has been applied.

Mercurochrome is accepted by the Council on Pharmacy and Chemistry of the American Medical Association.

* Reg. U. S. Pat. Off.

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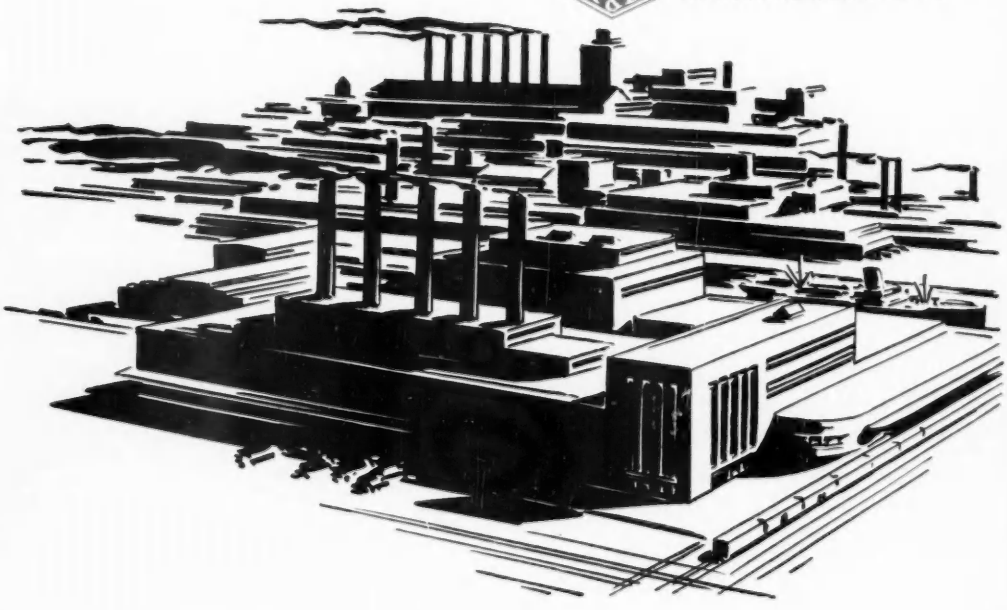
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